'Tis to ye Press & Pen we Mortals owe All hail ye great preservers of these arts
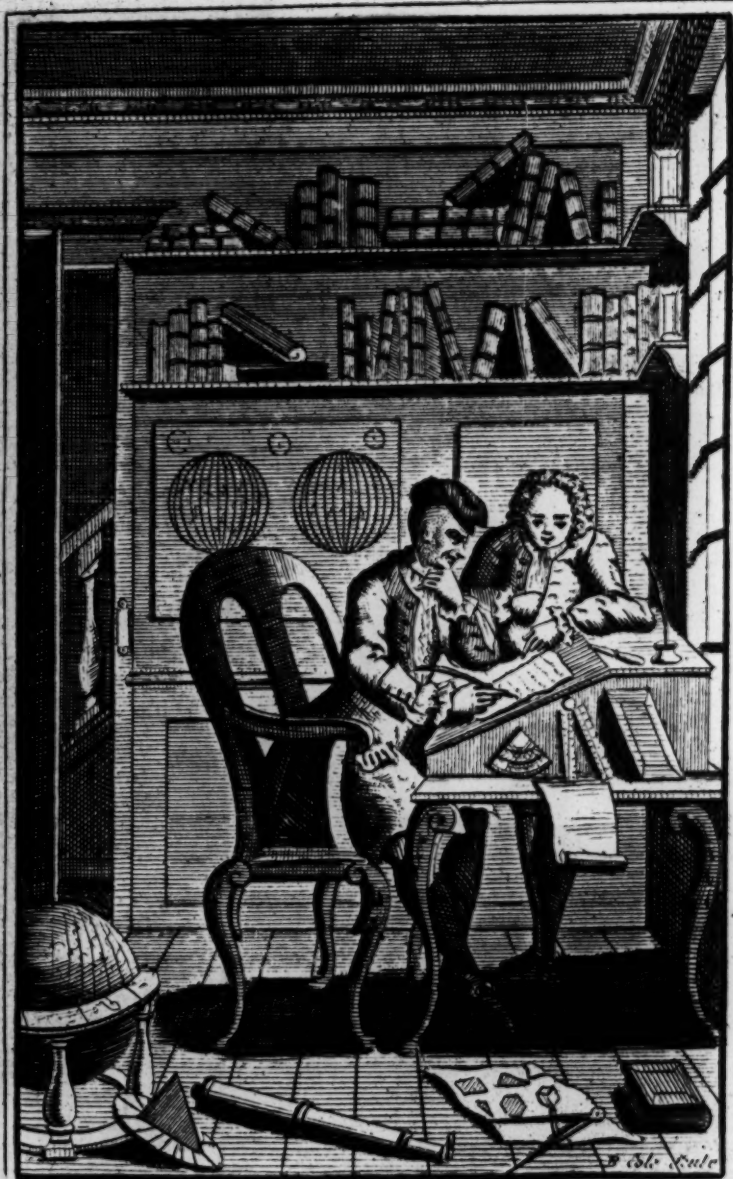All we believe & almost all we know That raise our Thoughts & cultivate our parts

B Cole Sculp

'Tis to ÿ Press & Pen we Mortals owe   All hail ÿe great preservers of these dirty
All we believe & almost all we know   That rais'd our Thoughts & cultivate our p...

THE
INSTRUCTOR:
OR,
Young Man's Best Companion.

CONTAINING,

Spelling, Reading, Writing, and Arithmetick, in an easier Way than any yet published ; and how to qualify any Person for Business, without the Help of a Master.

Instructions to write Variety of Hands, with Copies both in Prose and Verse. How to write Letters on Business or Friendship. Forms of Indentures, Bonds, Bills of Sale, Receipts, Wills, Leases, Releases, &c.

Also Merchants Accompts, and a short and easy Method of Shop and Book-keeping ; with a Description of the Product, Counties, and Market-Towns in *England* and *Wales.*

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Van Baviere

To which is added,
The FAMILY'S BEST COMPANION :

With Instructions for *Marking* on *Linnen* ; how to *Pickle* and *Preserve* ; to make divers Sorts of Wine ; and many *excellent Plaisters* and *Medicines,* necessary in all *Families* :

And also,

A COMPLEAT TREATISE OF FARRIERY :

Or, Good Advice to GENTLEMEN and FARMERS ; with a choice Collection of Remedies, very fit for all Farriers and Grooms.
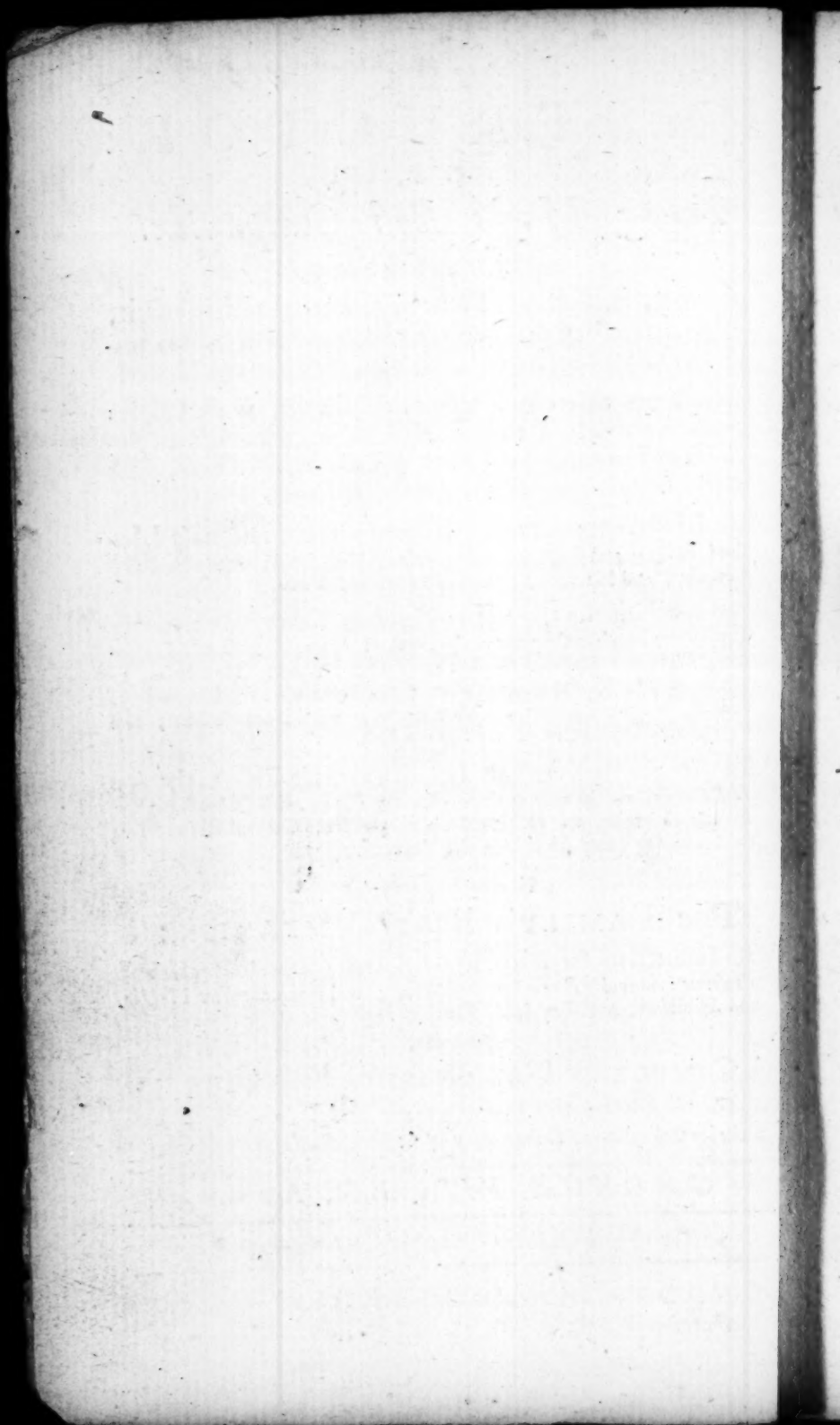
By *GEORGE FISHER,* Accomptant.

The Sixth Edition Revised and Corrected.

THE
PREFACE.

I Need say but little by way of Preface, in relation to the Usefulness of this Book, the Title Page so fully declaring its Contents: But as a Preface is usually expected, I must and cannot well avoid saying something with respect to its Utility.

As to the first Step of forming the young Man's Mind for Business, viz. The being instructed in, and acquainted with our Mother Tongue, viz. English, it must and is acknowledged by all, to be a due and principal Qualification in writing Business, and therefore it is necessary to be therewith well acquainted.

Then in the next Place, to write a good fair, free, and commendable Hand, is as necessary in most, if not in all the Affairs of Life, and Occurrences of Business.

The next Thing touched on, is in relation to the inditing of some few Epistles or Letters in a familiar Stile, and on sundry Subjects and Occasions: With Directions how to subscribe or conclude a Letter, and also to superscribe or direct Letters, according to the different Ranks, and Qualities of the Persons to whom directed: And this cannot be deny'd but to be a Qualification fit for a young Man, and also to others of more adult Years.

The

The next Accomplishment for a young Man, and largely treated on in this Book, is that excellent Science of Arithmetick, both Vulgar and Decimal: Leading him by the Hand, and by easy Stepts, through its whole Course.

Again the young Man is next shewn the ingenious Art of Book-keeping after the Italian Manner, by way of Double Entry; and that is an Accomplishment that capacitates him for Business in the highest Degree: Under which Head, he is also informed how to draw out, or make various sorts of Accompts or Writings relating to Mercantile Affairs; as Bills of Lading, Invoices, Accompts of Sales, together with Authentick Examples of Bills of Exchange, with Notes concerning them; likewise Bills of Parcels of divers Kinds; also various sorts of Receipts, &c. All which is expedient for a young Man to know and understand, if he would be dextrous in Business.

The young Man is here also instructed in relation to the Affairs of Business at the Water-side, as to Shipping off and Landing Goods, &c.

Next he hath a Description of England and Wales, each County being particularly spoken of, with respect to its Product, Soil, and Extent, and likewise the Names of its several Market Towns.

Here are also, easy, plain, and likewise curious Directions for Measuring all Sorts of Planes and Solids (Arithmetically and Instrumentally) as the Works of Carpenters, Joiners, Sawyers, Bricklayers, Masons, Plaisterers, Painters, Glasiers, &c. with the Prices of their Works,

Here is likewise shewn the Methods of extracting the Square and Cube Roots, with some of their Uses, in relation to Measuring, &c.

Also, Practical Gauging of divers Kinds of Vessels, Tuns, &c. Likewise Dyalling in various Kinds, with the Representation of the several sorts of Dials, and how to beautify and adorn them.

Next

Next are Precedents of Law Writings, as Bonds,
Bills, Indentures, Wills, Letters of Attorney, &c.

Lastly, some Directions relating to the pleasant and
delightful Art of Gardening, with general Observations
for every Month in the Year. To which is subjoined,
some Instructions to young Women how to Pickle and Pre-
serve all Kinds of Fruit and Flowers, &c. with Instruc-
tions for making divers sorts of Wines of English *Growth;*
and also for preparing many excellent Medicines, Plai-
sters, &c. with several good Prescriptions of proper Use
against most Distempers: Fit for, and necessary in all
Families.

To the whole is now added a compleat Treatise of Far-
riery, being a sure Guide to all Gentlemen and Farmers,
in relation to the Care and Management of their Horses,
Mares, &c. with proper Advice and Directions to a
Groom, fully and plainly setting forth the best Methods
of bringing up a good Horse, &c. from the Time of his
being foaled; so that he may answer every End expected
from him. In this Treatise are also included many ex-
cellent Receipts for the Cure of every Distemper incident
to Horses and Mares, more especially to those which have
not been properly or carefully brought up.

THE
INDEX:
OR,
TABLE of CONTENTS.

Prices

The CONTENTS of the Treatise of FARRIERY.

IN-

1

An easy Copy for Round Hand.

A B C D E F G H I K L M N

O P Q R S T U V W X Y Z

a b c d e f g h i k l m n o p q r s
t u v w x y z &c). 1.2.3.4.5.6.7.8.9.10.

Take great Care, and you'll Write fair.

The Italian Hand.

$\mathcal{A}$ $\mathcal{B}$ $\mathcal{C}$ $\mathcal{D}$ $\mathcal{E}$ $\mathcal{F}$ $\mathcal{G}$ $\mathcal{H}$ $\mathcal{I}$ $\mathcal{J}$ $\mathcal{K}$ $\mathcal{L}$ $\mathcal{M}$
$\mathcal{N}$ $\mathcal{O}$ $\mathcal{P}$ $\mathcal{Q}$ $\mathcal{R}$ $\mathcal{S}$ $\mathcal{T}$ $\mathcal{U}$ $\mathcal{W}$ $\mathcal{X}$ $\mathcal{Y}$ $\mathcal{Z}$

a b c d e f g h i k l m n o p q
r s t u v w x y z &c.

Art is gain'd by great Labour & Industry.

Flourishing Alphabet.

3.

Secretary Hand.

𝒜𝔅𝒞𝒟𝔢 𝔈𝒻𝒢𝒽𝒥𝒥 𝒦𝓛 𝔐𝔑𝔐

𝒪𝒫𝒬𝒬𝔯𝒮𝒯 𝒟𝒲 𝒳𝒴ℨℨ

A a b t ꝺ ε ſ g h i j k l m n o p q r ſ ſ ꝺ u w x y ʒ ʒ.	
ſtar God and honour the King.	

INSTRUCTIONS

FOR

YOUTH,

To Spell, Read, and Write

TRUE ENGLISH.

The Use of Great and Small Letters ; how to divide them into Vowels and Consonants ; what Diphthongs are, their Numbers, and how pronounced and written.

THE Subject Part of this Book being to inftruct Young (as well as Old) People, in the general Rules of Bufinefs and Converfation thereunto belonging, the firft Step I fhall take for forming the Mind for Bufinefs, is that moft neceffary Accomplifhmeat, the Spelling and Writing good and proper *Englifh* ; for let a Perfon write never fo good a Hand, yet if he be defective in Spelling, he will be ridiculed and contemptibly fmiled at, notwithftanding his fair Writing ; and which will indeed, make his Orthographical Faults the more confpicuous. But to the Matter.

Firft, We are to take Notice, that of Letters are made Syllables, of Syllables Words, and of Words Sentences, &c.

The Letters are in Number 24 ; to which if you add *j* and *v* Confonants, being of a different Shape and Sound from the reft, they make 26. As to the Letters, we are to obferve their Names, their Form, and their Force : Their Names, whereby to know them, their Form, whether great or fmall ; and their Force, in Pronunciation or Utterance.

Letters

Letters are diſtinguiſhed according to their Sound, into
Vowels and Conſonants : A *Vowel* is a Letter that ſoundeth
by it ſelf, and they be five in number, *viz. a, e, i, o, u,*
and *y* the *Greek* Vowel ; which alſo, is a Vowel in *Engliſh,*
when it cometh after a Conſonant, and hath the Sound of
i ; as in *by, fly, reply,* &c.   A *Conſonant* is a Letter that
ſoundeth not, except it be joined with a *Vowel,* for without
one of the *Vowels* no Syllable can be made ; as *b, c, d,* &*c.*
without the Aid of a *Vowel,* make nothing : So that *Vowels*
and *Conſonants* may be compared to *Nouns Subſtantive* and
Nouns Adjective, each requiring the others Aſſiſtance.
Though we have but 24 letters, and ſix of 'em *Vowels,* yet
we have 21 *Conſonants* ; for *j, v,* and *y,* when they are ſet
before any *Vowel* in the ſame Syllable, become *Conſonants*;
as was ſaid before concerning *y* ; as in *Jupiter, Juno, jilt,*
vulgar, violent, vigour, &c.   *Note,* That *j* Conſonant hath
the Sound of *g,* as in *join, jangle, jingle,* &c.

When two *Vowels* come or meet together in a Word, and
are not parted in the Pronunciation, but united in one Sound,
ſuch are called *Diphthongs* ; being 13, *viz. ai, ei, oi,* and
ui, au, eu, ou, ee, oo, ea, eo, oa, and *ei* ; as in *maid, faith,*
either, join, aul, eunuch, ſtout, feed, ſeed, food, brood,
ſtealth, wealth, people, ſteeple, boat, goat, heat, beat, feat,
friend, field, &c.   *Note,* That in the firſt 7 Words, both
Vowels are ſounded ; but in the other 15, one of them is
ſcarcely heard.

There are alſo thoſe that are called *Triphthongs,* where three
Vowels meet in one Sound ; as in *Beauty, Beau, Lieu,* and
View : Likewiſe *ay, ey, oy, uy* ; *aw, ew,* and *ow* become
Diphthongs at the End of Words, but are called *improper*
Diphthongs ; as in *ſay, key, joy, faw, bow,* &c.

Of Letters Great and Small, and when to be uſed.

FIRST Negatively, *Great Letters* are not to be uſed in
the middle or latter End of a Word, except the whole
Word be ſo written, as JEHOVAH, LORD, or Titles of
Books, &*c.* For it would be very abſurd to write thus :
Mr. geoRgE RoGeRs In thaMes StReEt.

1ſt, *Great Letters,* or *Capitals,* are written at the Begin-
ning of Sentences ; as, Fear God. Honour the King. Know
when to ſpeak, and when to hold your Tongue.

2dly, After every Period, or Full Stop, when new Mat-
ter begins : As, Some time after that Accident, another fol-
low

lowed, which was this, &c. London May 16. Turin June 12, &c.

3*dly*, All Proper Names of Persons, Places, Ships, Rivers, &c. are to begin with a Capital; as, *George, London,* the *Dreadnought, Thames, Severn* : All Christian Names and Surnames, both of Men and Women, must begin with a Great Letter ; as *Samuel Sharp, Mary Sweeting,* &c.

4*thly*, The more eminent Words in a Sentence ; as, Faith is the Foundation of the Christian Religion ; or, any Word that we have a particular Regard or Deference for ; as, *God, Christ, King, Queen,* &c.

5*thly*, At the Beginning of every Line in Poetry ; as,
Improve your Time ; Time passeth quickly on ;
Nor doth so good succeed, as that that's gone.

6*thly*, All Names of Arts, and Sciences, and Trades; as, *Writing, Arithmetic, Geometry, Musick, Carpenter, Smith,* &c. And evermore the Personal Pronoun *I*, and the Interjection *O*, must be Capitals.

For it is ridiculous to write thus : *On Monday last i came to your House, but you was not at home ; then i went,* &c.

Lastly, I think I may venture to give a general Rule when Capitals are to begin Words ; which is this : All Nouns Substantive may begin with a great Letter ; and a Substantive may be known by the Signs either of *A, An,* or *The* before them ; as, *a House, a Mill, an Ox, an Ass, the City, the River,* &c. And I think the Adjective (which declares what Sort of a Thing the Substantive is) may be with a Small, and the Substantive with a Great Letter ; as, *the white Horse, the long Rope, brown Bread, fat Beef,* &c.

Small Letters are commonly written in all other Places, as Verbs of the Active and Passive Voice, &c.

Observations concerning the Sound of Letters, and which are omitted in Pronounciation.

A Is not founded in *Pharaoh,* nor in *Sabaoth,* but as if written *Pharo,* and *Saboth* ; neither in *Marriage,* but as *Marrige* ; also *Parliament* as *Parliment,* and *Chaplain* as *Chaplin,* &c. In some proper Names it is not founded, but drop'd in the Pronunciation ; as in *Aaron, Isaac, Canaan, Balaam,* which are pronounced as if written *Aron, Isac, Canan, Balam* ; but we must except *Ba-al,* and *Ga-al.* *A* is founded broad like *aw,* in Words before *ld* and *ll* ; as in *ba'd, scald, hall, wall, fall,* &c.

B is not founded in *thumb, dumb, plumb, lamb, doubt, debt, subtle,* &c. but founded as if written *thum, dum, plum, lam, dout, det, suttle.*

C is founded hard like *K*, before *a, o,* and *u,* and before *l* and *r* ; as in these Words, *cane, came, comb, cub, clay, crane, crab* ; and soft in *cement, city,* and *tendency* : *C* loseth its Sound in *scene, science,* and *victuals,* and in *verdict,* likewise in *ind.ct, indictment* ; also before *k,* as in *stack, rack, stick, thick, brick.*

Ch is founded like *K,* in Words of Foreign Extraction, and in many proper Names of the Holy Scripture ; as in *Chorus, Chymist, Chrisostom, Christ, Chederlaomer, Baruch, Archippus,* &c. *Ch* in *French* Words sound like *sh*; as in *Chevalier,* pronounced as *Shevalier* : *Machine* as *Masheen, Mareschal* as *Marshal, Capuchin* as *Capusheen, Chaise* as *Shaize,* &c.

D is not founded in *Ribband,* ~~nor in Wednesday,~~ but pronounced as *Ribbin* ~~and Wensday~~ ; the Termination *ed,* is shortned into *t,* as *burned, burnt* ; *choaked, choakt* ; *ripped, ript* ; *passed, past* ; *choped, chopt* ; &c.

E is not founded in *heart,* neither in *hearth,* or *dearth,* &c. and seldom heard but in Monosyllables ; as in *me, he, she, ye, the,* &c. where it hath the Sound of *ee* : but in Words derived from the *Hebrew* and *Greek, e* hath its perfect Sound, as *Jesse, Jubilee, Mamre, Nineve, Candace, Cloe, Eunice, Penelope, Salmone, Phebe, Epitome, Catastrophe, Gethsemane,* and from the *Latin simile,* and *premunire,* &c. *E final,* or *e* at the End of a Word, serves to lengthen the Sound, and to distinguish it from other Words without *e,* which are founded short ; as in these Examples following, *viz. cane, can* ; *hate, hat* ; *bite, bit* ; *fare, far* ; *hope, hop* ; *made, mad* ; *mane, man* ; *scrape, scrap* ; *stare, star* ; *tune, tun* ; *write, writ,* &c. And in Words of more than one Syllable, lengthens the Sound of the last Syllable, but doth not encrease the Number of Syllables ; as *admire, demise, blaspheme,* &c. *E* lengthens the Syllable in *Tyre, Kenite,* and *Shu-la-mite.* *E* must not be made to lengthen a Syllable, when it is made short by two Consonants ; as in *pass, turn, black* ; not *passe, turne, blacke.* Words ending in *cre, gre,* and *tre,* found the *e* before the *r,* as in these Words ; *acre, lucre, centre, sepulchre,* ~~tygre,~~ *maugre, mitre, lustre* ; which are founded as if written *aker, luker, senter, sepulker,* ~~tyger,~~ *mauger, miter,* and *luster.* *E final,* when not founded, serves to soften *c* and

g, as in *ace, place, lace, spice, truce, oblige, huge, age,* &c. If Nouns in *e final* take *s* after them with an Apostrophe before it, it stands for *his,* as the *Pope's Eye,* or the *Eye of the Pope.* If without an Apostrophe, it makes the plural Number, as *Tables. E* must be joined to long *f* in these Words ; *Horse, Nurse, Purse ;* not *Hors, Nurs,* or *Purs.* If to *e* at the End of a Word, a long Vowel be added, the *e* is to be omitted, as in *writing, loving, doing,* &c. not *writeing, loveing,* or *doeing ;* except the Terminations *ge* and *ce* before *able,* as in *change-able, peace-able,* &c. *E* must not be written after a Diphthong, in these Words ; *vain, maid, gain, fear, gnaw,* &c. not *vaine, maide, gaine,* &c.

F in Plurals is changed into *v ;* as *strife, strives ; staff, staves.*

G is not sounded in *sign, reign,* neither in *gnaw, gnat, as-sign, design, seignior, seraglio, phlegm,* &c. but sounded as if *senior, seralio, fleme.* G is sounded soft in *gender, ginger,* and *gipsy ;* but hard in *Gibon, Giberah, Gilboa, Geth-se-mane ;* and hard also in these Proper Names, *Gibson, Gilman,* and *Gilbert :* and likewise in these common Words, *gelt, geld, gird, gimp, geese, gander, gabble, gather, gild,* &c. Observe, That if G be hard with a long Vowel, *ue* is joined, and pronounced in the same Syllable ; as in *Plague, Prague, Hague, rogue, league, dialogue, catalogue,* &c.

Gh in the End of some Words, where *au* or *ou* goes before, hath the Sound of *ff,* as in *tough, rough, cough, laugh,* sounded as if *tuff, ruff, coff, laff ;* but *huff, cuff, snuff,* and *buff,* must be so written.———— *Gh* is not sounded in *mighty, though, through,* neither in *daughter,* or *Vaughan.*

H hath Place, but no Sound, in *Chrystal, Chronicle, Christ, Ghost, John, Rhine, Schedule* and *Schism.* H is not sounded at the End of Words, if it be alone, without *t* or *c* before it, as *snatch, watch,* &c.

I is not sounded in *adieu, juice, ~~venison~~, fruit, bruise, Sa-lisbury ;* but sounded like *ee* in *oblige, Magazine,* and *Machine,* &c. *I* is sounded long in proper Names ending in *iah,* as *Jeremiah, Hezekiah ;* but short in *A-ri-el* and *Mi-riam.*————The tail'd *j,* or Consonant, hath been spoke of before.

K is nearly allied in Sound with *C ;* but to know when to use one, and when the other ; *Note,* That *C* hath the Force of *K* only before *a, o, oo,* and *u,* and these two Consonants *l* and *r ;* and therefore we must not write, *kare* for *care,*

kow

Row for *cow*, *krown* for *crown* : And the use of *K* is only before *e*, *i*, and *n* ; wherefore we must write *keep*, *key*, *knight*, *kill*, &c. not *crep*, *cei*, *cnight*, nor *cill* : We must write *Calendar*, *Catherine*, rather than *Kalendar*, or *Katherine*.

L is not sounded in *calf*, *half*, *chalk*, *stalk*, *walk* ; but pronounced as if *cafe*, *hafe*, *chauk*, *stauk*, *wauk*. Neither is *l* pronounced in *Bristol*, *Holborn*, *Lincoln*, *salmon*, or *chaldron* ; but sounded as if writ *Bristow*, *Hoburn*, *Lincon*, *sammon*, and *chaudern* ; nor in *Colonel*, where the first *l* hath the Sound of *rr*, as *Curronel*.

M hath the Sound of *n*, in the word *accompt*.

N is not heard in *autumn*, *lime-kiln*, *solemn*, *limn*, *hymn*, *column*, nor in *condemn*.

O is not sounded in *people*, *feoffee*, *bason*, *mutton*, and lost also in *yeoman*, *mason*, *righteous*, *bacon*, *jeopardy*, and *crimson*.—*O* sometimes sounds like *oo* ; as in *doing*, *moving*, *proving*, &c. *O* is not heard in *coroner*, *damosel*, ~~Nicholas~~, ~~carrion~~, nor in *chariot* ; but pronounced as if writ *crowner*, *damsel*, ~~Nicklas~~, ~~carrin~~, and *charrit*.——*O* is sometimes sounded like *i* ; as in *women*, and *flagon*, pronounced as if *wimmen*, and *flaggin*. And sometimes *O* is sounded as *u*, as in *conduit*, *conjure*, ~~attorney~~, and *Monmouth*, being heard as if writ *cundit*, *cunjer*, ~~attorney~~, and *Munmouth*.

P is written, but not sounded, in *empty*, *presumptuous*, *psalm*, *sumpter*, *accompt*, *attempt*, *psalter*, and *symptom* ; also in *sumptuous*, *contemptuous*, *receipt*, and *consumptive*, &c.

Ph have the Sound of *f*, when together in one Syllable ; as in *philosophy*, *physician*, *Asaph*, and *elephant* ; but we must not write *filolosophy*, *fysitian*, nor *Asaf*, or *elefant* : *Ph* are parted in *shep-herd*, *up-hold*, and in *Clap-ham* ; and other such compounded Words.

Q After *Q* always follows *u* in all Words ; and in *French* Words it hath the Sound of *k* ; as in *risque*, *liquor*, *catholique*, *banquet*, *conquer*, *masquerade*, *chequer* : pronounced as *risk*, *likker*, *chatholic*, *banket*, &c.

S is not sounded in *island*, *viscount*, or *isle*, nor in *Lisle* ; but pronounced as *Iland*, *vicount*, *ile*, and *Lile*.

There be two Sorts of *s*'s, the long *ſ*, thus *ſ*; and the little *s*, thus *s*; the long *ſ* in the Beginning and Middle of Words, (but never at the latter End) and the short or small *s* at the latter End of Words, and sounds *hard* like *z*, in all the Words of the plural Number, and in Words of the third Person ; as *names*, *worms*, *he reads*, *she hears*. *S* sounds

hard

hard in Words that terminate in *fion,* as in *circumcifion, eva-fion, delufion* ; but after a Confonant *foft,* as in *converfion, commiffion, dimenfion.* S is likewife founded hard in thefe Words, *raife, praife, chaife, cheefe, thefe, compofe, expofe, bruife, refufe, applaufe, paufe, claufe, wifdom, cafement,* and *damfel.* ———— I do not think it any very great Abufe, to have the fmall *s* fometimes in the Beginning or Middle of a Word, as well as at the latter End ; efpecially if a *t* follows it, thus, *st.*

Th founds *fine* in *thin, think,* and *wrath* ; and is founded hard in *thee, then, they, that, blithe, tithe,* and *fithe* ; alfo in *mother, brother, hither, thither* ; and in *loath, cloath* and *clothier,* &c.   *Scythe;*

Ti before a Vowel or Diphthong, hath the Sound of *fi* ; as in *patience, dictionary, gratian, oblation, nation, tranfla-tion* ; except when *f* goes juft before it, as in thefe Words, *queftion, fuftian, baftion, combuftion,* and *celeftial,* and alfo *beftial,* &c. In fome Words of *Hebrew* and *Greek, ti* re-tains it natural Sound ; as in *Shealatiel, Phaltiel, Shepha-tiah, Cotittia, Adramyttium,* and the like ; and in *mightier* and *mightieft, emptieft, emptied* ; and from *pity,* we fay *pi-ti-able.*

U is founded like *i* in *bury, birry* ; *bufy, bizze* ; *bufinefs,* as *biznefs.*

W is not founded, though written, in *anfwer, fword, whore,* nor in *fwooning, awry* ; neither is it heard in *wrap, wrath, wrong, wretch, wreath, wrangle, wriggle* ; but pro-nounced as if *ford, hore, founing,* and hath the Sound of *R* in the laft feven Words, *viz. rap, rath, rong,* &c.

Wh belongs to Words purely *English* ; as *what, when, where* and *wheel.*

X is founded as *z,* in *Xenophon, Xerxes, Xenocrates,* and *Xantippe.*

Y is either a Vowel or Confonant, as hinted before. A *Vowel,* in *my, by, fly, thy* ; and fometimes, when a *Vowel,* it hath the Sound of *ee,* as in *worthily, chriftianity, liberty, formerly, formally, Normandy,* and *Dorothy. Y* is a *Confo-nant* when it begins a Word, as in *yet, you, yonder, younger,* and *yefterday.*

Z hath its proper Sound, in *Zeno, zeal, zealous,* and in *Zenobia,* ~~It hath the Sound of f in~~ *Elizabeth, fize, prize,* and *Melchizedeck* ; ~~the firft of which Words hath been for-merly, and fometimes now is, writ with an f, thus, Elifabeth.~~

Thus far for the Sound of Letters single ; and now I shall give a few Notes concerning two Letters, when they are u-nited in one Sound, called *Diphthongs* : and first of

Ai and *Ay.* These have the Sound of *a*, in *air, fair, pair, may, stay, play* ; but *a* is lost in *Calais*, (a Town of *France*) and pronounced separately in *Sinai*, (a Mountain of *Arabia*.)

& like a, in *Ei* and *Ey*, are founded in *eight, streight, sleight,* and *hey-day !* and are pronounced as *e*, in *key, veil,* and *convey* ; but *eye* must be excepted : And *ei* is founded as *a*, in *neighbour*, and *heir*, being pronounced as *nabor* and *are*.

Oi and *Oy* have a Sound peculiar to themselves ; as in *oil*, and *oyster* ; but make no Diphthong in *going* or *doing.*

Au and *Aw* commonly keep a proper Sound ; as in ~~augur~~, **augre,** *austere, daw, maw, saw,* &c. but *au* is lost in *aunt* and *gauger*, being founded as *ant* and *gager* ; likewise is not heard in *Em-ma-us*, and *Ca-per-na-um.*

Eu and *Ew* have an united Sound in all Words, as in *feud, brew, new,* and *grew* ; but *eu* is no Diphthong in *Za-che-us*, or in *Bar-ti me-us.*

Ou and *Ow.* *Ou* is expressed in *foul, soul, proud, loud* ; and *ow*, in *bow, cow,* and *now* ; but *ow* founds like *oo*, in *soup* (a French Dish,) *Stroud* (a Town in *Kent*,) and *Cow-per* (a Man's Name,) founded as if *soop, Strood,* and *Cooper.*

Ee is no Diphthong in *Be-e-rites, Be-er-she-ba*, and in *Be-el-ze-bub*, one of the *e's* is dropt in the Pronunciation ; neither in Words beginning with *re*, or *pre* ; as *re enter, pre-e-mi-nence.*

Oo is properly founded in *cool, fool, pool,* and *tool* ; but hath the Sound of *u*, in ~~root~~, *foot*, and *soot* ; and makes no Diphthong in *Co-os, co-o-pe-rate.*

ē *Ea* founds like *ee*, in *sea, pea, seam,* and *ream* ; and hath the Sound of *ĕ*, in *bread, head, lead, dead, search, leather, feather, heaven*, and *leaven* ; but is no Diphthong in *ven-ge-ance, mi-scre-ant*, or any *Hebrew, Greek*, or *Latin* Words ; as in *Ka-desh, Bar-ne-a, Kir-jath-je-a-rim*, nor in *Ce-sa-re-a, i de-a*, or *o-ce-an* ; neither in *re-al, be-a-ti-tude, cre-a-tor* ; but except *creature*, nor in Words beginning with *pre*, as *pre-amb'e*, &c.

Oa is founded as *o*, in *goat, boat,* and *coat* ; and founded broad, as *au*, in *broad* and *groat* ; but is no Diphthong in *Go-a*, (a City in *India*,) or in the *Hebrew* Words *Zo-an, Zo-ar*, and *Gil-bo-a.*

Ie

Ie before a single Consonant, sounds like *ee*, as in *brief*, *chief*, and *thief*; but if before two Consonants, it sounds like *e*; as in *friend*, *field*; but at the End of *English* Words, *e* final is not heard, as in *die*, *signifie*; and is no Diphthong in *A-bi-e-zer*, *E-li-e zer*, nor in the *English* Words ~~dier~~, *car-dyer* ~~rier~~, or *clo-thi-er*; and in Words derived from the *Latin*, *ie* is parted, as in *cli ent*, *o-ri-ent*, *qui-et*, and *sci-ence*.

Ui is sounded as *u*, in *juice*, *fruit*, and *suit*; but *u* is lost in *conduit*, *build*, and *guise*, and is no Diphthong in *je-su-it*, *ge-nu-in*, or *fru-i-tion*.

Æ and *OE* be no *English* Diphthongs, but are used in *Æsop*, *Æneas*, *Ætna*, *Cæsar*, *Oedipus*, and *Oeconomy*; but in common Words they are neglected; as in *equity*, *female*, and *tragedy*, tho' derived of *æquitas*, *fæmina*, and *tragædia*.

Of Syllables, *and their Divisions, being the Art of Spelling.*

A Syllable is a taking Letters together, and uttering them in one Breath, as *vir-tue*; so that *virtue* being thus divided, or taken asunder, makes two Syllables, *viz. vir* and *tue*; which put together, forms the Word *virtue*. And many times a Vowel, or a Diphthong, of themselves, make a *Syllable*; as in *a-bate*, *e-ve-ry*, *i-dle*, *o-ver*, *u-su-ry*; *ry.* so of Diphthongs, as *au-ger*, *Eu-stace*, *ow-ner*, *ai-der*; *oy-ster*, *Ea-ten*, *oa-ten*: By which we may particularly note, That no Syllable can be made, be there never so many *Consonants*, or so few, without the aid of a *Vowel* or *Diphthong*.

The longest *Monosyllables* we have have in *English*, are *length*, *strength*, and *streights*; which still would be nothing, without the Vowel *e* and *i*.

All Spelling may be taken in, under these four following general Rules, or Heads.

ıſt, When a *Consonant* comes between two *Vowels*, in dividing the Word into *Syllables*, the *Consonant* is joined to the latter Vowel; as in *fea-ture*, *na-ture*, *de-li-ver*, *u-ni-ty*, &c. except compound Words, which terminate in *ed*, *en*, *eſt*, *eth*, *er*, *ing*, *iſh*, and *ous*; as *coaſt-ed*, *gold-en*, *know-eſt*, *know-eth*, *bear-er*, *fool-ing*, *bar-ba-rous*, *ra-ve-nous*, and *ſub-urbs*.

2*dly*, When two *Consonants* come together in the Middle of a Word, they are to be parted, if not proper to begin a Word; as *num-ber*, *ſtran-ger*, *for-tune*, &c. not *numb-er*, *ſtrang-er*, *fortune*: To this Rule is excepted Words with *x*, as *ox-en*, *ex-er-ciſe*, &c. When the same Consonant is doubled

B 5

in

in a Word, the firſt belongs to the foregoing, and the latter to the following Syllable, as in the Rule above, and in theſe words, *Ab-ba, ac-cord, an-no, ad-der,* &c.

3*dly, Conſonants* that can begin Words, muſt not be parted in the Middle ; as *a-gree, be-ſtow, re-frain,* &c. not *ag-ree, beſ-tow, ref-rain.*——Theſe *Conſonants* may begin Words, *viz. bl, br, ch, cr, dr, dw, fl, fr, gh, gl, gr, kn,* &c. as *blunt, break, chaw, cry, draw, dwell, fleſh, ghoſt,* &c. On the contrary, *Conſonants* that cannot begin Words, muſt be parted in the Middle, as in *Sul-tan,* and as ſaid above.

4*thly,* When two *Vowels* come together, not making a Diphthong, they muſt be divided ; as in *vi-al, va-li-ant, Li-o-nel, du-el, cru-el, me-te-or,* and *La-o-di-ce-a.*

Some particular Notes.

L is doubled in Words of one Syllable ; as *well, tell, ſwell, hall, wall, fall, will, bill, mill,* &c. But in Words of more than one Syllable, the word always terminates with ſingle *l,* as *angel, Babel, hurtful, dutiful,* and *beautiful.* Neither muſt *l* be doubled in *alway, alſo, although* ; not *allway, allſo, allthough,* &c. But Words accented on the laſt Syllable, muſt be excepted from the Rule above, *viz. inſtáll, recáll, inróll, rebéll,* and *repéll.*

Y muſt be uſed before the Termination *ing,* as *buying, lying, carrying, marrying, paying, ſlaying, burying,* &c.

The long *ſ* muſt never be uſed at the End of a Word, or immediately after the ſhort or ſmall *s.*

X ſhould be uſed inſtead of *ct,* where it appears to have been in the Original ; as *reflexion, connexion,* rather than *reflection,* or *connection,* &c.

Remember, that if you cannot write out the whole Word at the End of the Line, break it off at the End of a Syllable, thus —————————————————————————— con-demn ; not thus———————————————— cond-emn: Again ———————————————— diſ-charge ; not ———————————————— diſc-harge.

C muſt not be put between two *Conſonants* ; as *think,* not *thinck; thank,* not *thanck; brink,* not *brinck;* but if a Vowel goes before *c,* you muſt write *c* before *k,* as *brick, ſtick, thick,* &c.

E final muſt not be placed after a Syllable made long by a Diphthong, as *rain,* not *raine* ; *brain,* not *braine* ; *re-ſtrain,*

ſtrain, not *reſtraine,* &c. Neither is it neceſſary after a double Conſonat, as *inn,* and *add;* not *inne,* or *adde:* But we muſt except *Anne,* a Chriſtian Name, and *Donne,* a Surname; and alſo *Deale,* the Name of a Town in *Kent.*

Ph muſt be retained in Words of a Foreign Original; as *Albaney, prophet;* not *faney, profet.*

U follows *Q* in all Words, as was ſaid before.

Q is better than *C,* in ſome Words from the *Latin,* as *oblique, antique, relique,* rather than *oblike, antike,* or *relike.* Alſo *paquet, riſque, traffique,* and *Fabrique,* from the *French.*

K is by ſome thought unneceſſary in Words of Foreign Extraction, *viz. arithmetic, muſic, logic, publick, catholic,* and *phyſic;* rather than *arithmetick,* &c.

Of *S* and *C.* Some People may eaſily drop into Error by miſtaking *S* for *C,* as in the Beginning of the following Words, where *C* hath the perfect Sound of *S,* though *C* muſt undoubtedly be written, *viz.* in

Ceiling	Cinnamon	Cell	Ceruſs
Celeſtial	Ceremony	Cenſer	Centre *ter*
Civet	Cellar	Celerity	Cinque
Certain	Cenſure	Cypreſs	Cypher
Cymbal	Cenſor	Circle	City
Ciſtern	Ceaſe	Circuit	Citron
Centurion	Celebrate	Cement	

But theſe Words muſt be written with *S, viz.*

Science	Sceptre	Scarcity	Sciatica
Schedule	Scheme	Schiſm	Scythian.

When to write *ti,* and when *ſi* ———*viz.*

with ti.	*with* ſi.
Contention	Confuſion
Action	Occaſion
Contradiction	Contuſion
Attention	Oppreſſion
Benediction	Alluſion
Apparition	Aſcenſion
Concoction	Averſion
Declaration	Aſperſion
Ambition	Commiſſion
Contrition	Comprehenſion
Oration	Circumciſion
Oblation	Concluſion.

Theſe

These Words spell thus,

Paffon, *not* Pashon. Salifbury, *not* Salfbury.
Fashion, *not* Fation. Leicefter, *not* Lefter.
Cushion, *not* Cution. Shrewfbury, *not* Shrofbury.
Gloucefter, *not* Glofter. Carlifle, *not* Carlile.
Worcefter, *not* Worfter. ~~Weftminfter, *not* Weftmifter.~~

Another Qualification in Spelling, is rightly to diftinguifh Words of the *fame Sound* though widely different in their Senfe and Signification : Such as thefe that follow, *viz.*

A.

ABel, Cain's Brother
Able, to do a Thing
A Bell, to ring
Accidents, Chances
Accidence, a Book
Acre, of Land
Acorn, of an Oak
Achor, a Valley of that Name
Advice, Counfel
Advife, to counfel
Account, Efteem
Accompt, of Reckoning
Ale, a Drink
Ail, Trouble
All, every one
Awl, for Shoemakers
Alley, a narrow Place
Ally, a Friend or Confederate
Allay, or give Eafe
Alloy, bafer Metal
Altar, for Sacrifice
Alter, to change
Ale hoof, an Herb
Aloof, at a Diftance
Allow'd, approv'd
Aloud, to fpeak fo
Amifs, wrong
A Mifs, or Miftrefs
Ant, a Pifmire
Aunt, a Father's Sifter
Anchor, of a Ship
Anker, a Rundlet

A Peal of Bells
Appeal, to higher Powers
Appear, to be feen
A Peer, a Lord
Aray, good Order
Array, to cloth
A Rofe, to fmell to
Arofe, did rife
Are, they be
Heir, to an Eftate
Arrant, notorious
Errand, a Meffage
Arrows, to fhoot
Arras, Hangings
A Scent, or Smell
Afcent, a going up
Affent, Agreement
Affiftance, Help
Affiftants, Helpers
Augur, a Soothfayer
Augre, to bore with
Ax, to cut with
Acts of Parliament
Auftere, fevere
Oyfter, a Shell-fifh

B.

Babel, the Tower
Babble, to prate
Bacon, Hog's Flefh
Baken, in the Oven
Beckon, to make a Sign *ke*
~~Bale,~~ a Surety *Bail,*
Bale of Goods

Bald,

Bald, without Hair
Bawl'd, cry'd out
Ball, to play with
Bawl, to cry aloud
Barbara, a Woman's Name
Barbary, in Africa
Barberry, a Fruit
Bare, naked
Bear, a Beaft, or to bear
Bays, of Bay-Trees
Baize Cloth, of *Colchefter*
Bafe, vile
Bafs, in mufic
Belly, Part of the Body
Belie, to fpeak falfely
Be, they are
Bee, that makes Honey
Beer, to drink
Bier, to carry the Dead on
Bell, to ring
Bel, an Idol
Berry, a fmall Fruit
Bury, the Dead
Blue, a Colour
Blew, as the Wind
Board, a Plank
Bor'd a Hole
Boar, a Beaft
Bore, to bore
Boor, a Country Fellow
Bold, Confident
Bowl'd, at the Jack
Bolt, the Door
Boult, the Meal
Bow, to bend, or the Bow
Bough, of a Tree
Boy, a Lad
Buoy, of an Anchor
Bread, to eat
Bred, brought up
Breeches, to wear
Breaches, broken Places
Bruit, a Report

Brute, Beaft
Burrow, for Coneys
Burrough, a Corporation
By, near
Buy, with Money
Brews, he breweth
Bruife, a Hurt
Brewis, of Fat and Breed

C.

Cain, that kill'd his Brother
Cane, to walk with
Caen in Normandy
Ca'ais in France
Chalice, a Cup
Call, by Name
Cawl or Suet
Cannon, a great Gun
Canon, a Church Rule
Capital, great or chief
Capitol, a Tower in Rome
Career, full Speed
Carrier, of Goods
Cellar, for Liquors
Seller, that felleth
Cenfer, for Incenfe
Cenfor, a Reformer
Cenfure, to judge
Centaury, an Herb
Century, an hundred Years
Centry, or Sentinel, a Soldier
 on Guard
Chair, to fit in
Chare, a Job of Work
Champaigne, Wine of *France*
Champaign, a wide Field, or
 Summer's Expedition
Choler, Rage or Anger
Collar of the Neck
Coller, of Beef or Brawn
Ceiling of a Room
Sealing, with a Seal
Cittern, for Mufic
Citron, a Fruit

Clerk,

Clerk, a Clergyman
Clerk of a Parish
Clause, Part of a Sentence
Claws of a Beast or Bird
Coat, a Garment
Cote for Sheep
Comb for the Hair
Come hither
Commit, to do
Comet, a blazing Star
Common, usual
Commune or converse
Condemn to Death
Contemn, to despise
Council of the King
Counsel, Advice
Cou'd or could
Cud, to chew as Beasts
Current, a passing or running Stream
Courant, a Messenger or News-Paper
Currants, Fruit
Crick in the Neck
Creek of the Sea or River
Cousin, a Relation
Cozen, to cheat
Cymbal, a musical Instrument
Symbol, a Mark or Sign
Cypress, a Tree
Cyprus, an Island
Cruse for Oil
Cruize, by the Sea Coast
Cygnet, a young Swan
Signet, a Seal

D.

Dane, of *Denmark*
~~*Daign*~~, to vouchsafe *Deign*,
Dam, stopping Water
Damn, to condemn
Dame, a Mistress
Dear of Price
Deer, in a Park

Deceased, dead
Diseased, sick
Decent, becoming
Descent, going down
Dissent, to disagree
Deep, low in the Earth
Diep, a Town in *France*
Defer, to put off
Differ, to disagree
Derbe, a City of *Asia*
Derby, a Town of *England*
Desert, Merit
Desart, a Wilderness
Dew, a falling Mist
Due, owing
Do, to make
Doe, a Female Deer
Dough, Paste
Don, a *Spanish* Lord
Done, acted
Dun, of Colour
Dolphin, a Fish
Dauphine, the *French* King's eldest Son
Devices, Inventions
Devizes, in *Wiltshire*
Doer, that doth
Door of a House
Dragon, a Beast
Dragoon, a Soldier
Draught of Drink
Drought, Dryness
Dolour, Grief or Pain
Dollar, a Piece of Money
Demure, sober
Demur, a Stop or Doubt

E.

Ear of the Head
E'er, ever
Early, betimes
Yearly, every Year
Earth, the Ground
Hearth of the Chimney

Easter,

Easter, the Festival
Esther, a Woman's Name
Enter, to go in
Interr, to bury
Elder, not the Younger
Eldern, a Tree
Eaten or swallowed
Eton, a Town's Name
Eminent, famous
Imminent, over Head
Enow in Number
Enough in Quantity
Earn, to deserve
Yarn, Woollen Thread
Yearn, to pity
Envy or Hatred
Envoy, a Messenger
Exercise, Labour or Practice
Exorcise, to conjure
Err, to mistake
Er, Brother to *Onan,* Sons of *Judah*
Extant, in being
Extent, Distance

F.

Fain, desirous
Feign, to dissemble
Fair, beautiful, or a Market
Fare, Victuals
Faint, weary
Feint, a false March
Fourth in Number
Forth, to go out
Feed, to eat
Fee'd, rewarded
Fir, Wood
Fur or Hair
Felon, a Criminal
Fellon, a Whitlow
File of Steel
Foil, put to the worst
Fly as a Bird
Fly, or Insect

Fillip with the Fingers
Philip, a Man's Name
Flower of the Field
Flour, Meal
Floor of a Room
Follow, to come after
Fallow, Ground not plow'd
Find, to find any thing
Fin'd, amerced
Fiend, a Devil
Flea off the Skin, and also a Vermin
Flee, to escape
Fowl, a Bird
Foul, dirty
Francis, a Man's Name
Frances, a Woman's Name
Frays, Quarrels
Froise, Pancake with Bacon

G.

Gall of a Beast
Gaul, France
Garden of Herbs
Guardian, an overseer
Genteel, graceful
Gentile, a Heathen
Gentle, mild
Gesture, Carriage
Jester, a merry Fellow
Groan with Grief
Grown, greater
Guilt of Sin
Gilt with Gold
Greater, bigger
Grater for Nutmegs
Grave for the Dead
Greave, Armour for the Leg
Guess, to imagine
Guest, one entertain'd
Gluttonous, greedy
Glutinous, sticking as Pitch
Great, large
Grate for Coals, &c.

Gratz,

Graze, to eat Grafs
Grays, a Town
Groat, Four-pence
Grot, a Cave
Gallies, Ships with Oars
Gallows for Criminals
H.
Hare of the Fields
Hair of the Head
Harfh, fevere
Hafh, minced Meat
Haven, a Harbour
Heaven, a large Place of Happinefs
Heart of the Body
Hart of the Woods, or an over-grown Buck
Herd of Cattle
Heard, did hear
Hard, not foft, or difficult
Here, in this Place
Hear with the Ears
High, lofty
Hie, away, make hafte
Him, that Man
Hymn, to fing
Hail, congeal'd Rain
Hale, the Ship
Hall, in a Houfe
Haul, pull
Higher, taller
Hire, Wages
His, of him
Hifs, as a Snake ; or to deride
Hoar Froft
Whore, a lewd Woman
Hole, or Hollownefs
Whole, intire
Ho ! lo ! to call
Hallow, to make holy
Holy, pious
Wholly, intirely
Home, one's Houfe

Holm, Holly
Hoop, for a Tub
Whoop, or ho ! lo !
Hugh, a Man's Name
Hue, of Colour
Hew, with an Ax
I.
I, I myfelf
Eye, to fee with
Idle, lazy
Idol, an Image
I'll, I will
Ile, of a Church
Ifle, an Ifland
Oil, of Olives
Imploy, in Work
Imply, to fignify
In, within
Inn for Travellers
Incite, to ftir up
Infight, Knowledge
Ingenious, of quick Parts
Ingenuous, candid
Iron, Metal
Ironie, fpeaking by Contraries
K.
Ketch, a Ship
Catch, to take
Kill, to flay
Kiln, for Lime
Kind, good-natur'd
Coin'd Money
Knave, difhoneft
Nave of a Wheel
Knight by Honour
Night, Darknefs
L.
Laid, placed
Lade, the Water
Lane, not a Street
Lain, did lie
Latin, a Tongue
Latten, Tin

Lattice,

attice, of a Window
ettice, a Woman's Name
ettuce, Sallad
eafe of a Houfe
eafh, three
ees of Wine
eefe, old Word for lofe
eaper, that jumpeth
eper, one leprous
effen, to make lefs
effon, to read
eaft, fmalleft
eft, for fear
ethargy, Sleepinefs
iturgy, Church-fervice
ier in wait
yar, that tells lies
imb, a Member
imn, to paint
ine, Length
oin of Veal
ow, humble
o, behold
ofe, to fuffer Lofs
oofe, to let go
ower, to let down
ur, to frown

M.

ade, finifhed
aid, a young Woman
ain, Chief
ane of a Horfe
ale, the He
a l, Armour
anner, Cuftom
anor, a Lordfhip
arket, to buy or fell in
ark it, note it
arfh, low Ground
afh, for a Horfe, or of a Net
artin, a Man's Name
arten, a Bird

Mead, a Meadow
Mede, one of Media
Mean, of low Value
Mein, Carriage or Afpect
Meat, to eat
Mete, to meafure
Meffage, Bufinefs
Meffuage, a Houfe
Mews for Hawks
Mufe, to meditate
Mighty, powerful
Moiety, half
Mile, Meafure
Moil, Labour
Might, Strength
Mite in Cheefe
Moat, a Ditch
Mote in the Sun
More, in Quantity
Moor, a Black
Mower that moweth
Moore, barren Ground
~~*Mortar,*~~ made of Lime   *Morter*
~~*Moltar,*~~ to pound in   *Mortar*
Mole, Vermin
Mould, to caft in

N.

Nay, denial
Neigh, as a Horfe
Neither, none of the two
Nether, lower
Naught, bad
Nought, nothing
Nigh, near
Nye, a Man's Name
Nice, curious
Niece, a Brother's Daughter
Not, denying
Knot, to tye
Note, mark
Note of one's Hand
Nofe of the Face
Noah's Ark

O.

O.

Oar of a Boat
Ore, crude Metal
O'er, over
Off, caſt off
Of, belonging to
Our, belonging to us
Hour of the Day
Oh ! alas !
Owe, in Debt
One in Number
Own, to acknowledge
Order, Rule
Ordure, Dung

P.

Pair, a Couple
Pare, cut off
Pear, a Fruit
Pattin for a Woman
Patent, a Grant
Peer, a Lord
Pere of Dover
Peter, a Man's Name
Petre, Salt
Pail, for Water
Pale of Countenance
Pale, a Fence
Place, Room
Plaiſe, a Fiſh
Parſon of the Pariſh
Perſon, any Man
Pole for Hops
Poll of the Head
Pool of Water
Pore with the Eyes, or of the
  Skin
Poor, neceſſitous
Palate of the Mouth
Pallet-Bed
Poſy, a Noſegay
Poeſy, Poetry
Power, mighty
Pour as Water

Prey, a Booty
Pray, beſeech
Profit, Gain
Prophet, a Foreteller
Practice, Exerciſe
Practiſe, to exerciſe
Preſence, being here
Preſents, Gifts
Princes, the King's Sons
Princeſſes, the King's Daugh-
  ters
Pleaſe, to content
Pleas, Defences
Precedent, an Example
Preſident, Chief
Principal, Chief
Principle, the firſt Rule

Q.

Quire of Paper
Choir of Singers
Queen, the King's Wife
Quean, an Harlot

R.

Rack, to torment
Wreck of a Ship
Rain Water
Reign of the King
Rein of a Bridle
Rays of the Sun
Raiſe, lift up
Race, to run
Raſe, to demoliſh
Rice, Grain
Riſe, to get up
Red in Colour
Read the Book
Reed of the Water
Relick, a Remainder
Relict, a Widow
Roe of a Fiſh, or a Female
  Deer
Row the Boat
Right, not wrong

Ritt

Rite, a Ceremony
Write with a Pen
Wright, a Wheelwright
Redish of Colour
Radish, a Root
Rear, set up
Rere, behind
Ruff, for the Neck
Rough, not smooth
Rie, Corn
Ry, in *Suffex*
Wry, crooked
Ring the Bells
Wring the Hands
Rime, a Fog or Mist
Rhyme, Verse
Rind of Cheese
Rode, did ride
Road, the Highway
Rote, got by Heart
Wrote, did write
Wrought, did work

S.

Savour, Taste or Smell
Saviour, that saves
Sheep, a Beast
Ship, for the Sea
Sight, View
Cite, to summons
Sail of a Ship
Sale of Goods
Sink, sink down
Cinque, Five
Slow, not quick
Sloe, Fruit
Sow Seed
Sew, with a Needle
So, thus
Sleight, neglected
Sleight of Hand
Some, a Part
Sum of Money
Soul, or Spirit

Sole, a Fish
Sole of a Shoe
Son of a Father
Sun in the Firmament
Sore, painful
Soar aloft
Swore, did swear
Stare, to look earnestly
Stair, a Step
Stile, to get over
Style of Writing
Sound, whole, firm; also
   Noise
Swoon, to faint away
Straight, not crooked
Strait, narrow
Succour, Help
Sucker, a young Sprig
Spear, a Weapon
Sphere, a Globe

T.

Then, at that Time
Than, in Comparison
Tame, gentle, not wild
Thame in *Oxfordshire*
Tear, to rent
Tear of the Eye
Tare, an Allowance in Weight
Tare, a Vetch
Tail of a Beast
Tale, a Story
Tiles for the House
Toyles, Nets
Toil, to Labour,
There, in that Place
Their, of them
Throne of the King
Thrown, as a Stone
Tide, a flowing Water
Ty'd, made fast
Time of the Day
Thyme, an Herb
Team, of Horses
Tun, Measure.
Ton, Weight.

Teem,

Teem, with Child

Twice, twice one

To, the Preposition

Too, likewise

Toe of the Foot

Tow, to draw

Tow, to spin

Told, as a Story

Toll'd, as a Bell

Tour, a Journey

Tower of a Church

V.

Vacation, Leisure

Vocation, a Calling

Veil, a Covering

Vale, between two Hills

Vain, foolish

Vein, of the Body

Vane, or Weathercock

Value, Worth

Valley, a Vale

Vial, a Glass

Viol, a Fiddle

U.

Your, of you

Ewer, a Bason

Use, Practice

Use, to be wont

Ewes, Sheep

W.

Wade in the Water

Weigh'd in the Scales

Whale of the Sea

Wail, lament

Ware, Merchandize

Were, was

Where, what Place

Weigh, to weigh

Wey, five Quarters

Weal, good

Wheal from Scourging

Wield, a Sword

Weald, of *Sussex* in *Kent*

Wen, in the Neck

When, at what Time

White of Colour

Wight, an Island

Whist, Silence

Wist, knew

Wood of Trees

Wou'd, for would

Y.

Yea, Yes

Ye, you

Ewe, a Sheep

Yew, a Tree

Yarn, made of Wool

Yearn, to weep

Of Stops, Marks, and Points, used in Reading and Writing, with their Places and Significations.

THESE are of absolute Necessity; and great Regard ought to be had to them, to avoid Confusion and Misconstruction, and for the better understanding of what we read and write ourselves; and are likewise of Use to others that shall hear us read, or see our Writing: They teach us to observe proper Distances of Time, with the necessary Raising and Falling of the Tone or Voice in Reading, and the needful Stops or Marks to be used in Writing, that we may understand it ourselves, and that our Meaning may not be misunderstood or misapplied by others.

Stops,

Stops, or Pauses, confider'd as Intervals in Reading, are indeed no more than four; though there are other Marks to be taken notice of, but to other Purpofes: The Names of thefe four principal Stops are, *viz.* a *Comma*, *Semicolon*, *Colon*, and *Period* or *Full Stop*; and thefe do bear to one another a kind of progreffional Proportion of Time; for the *Comma* fignifies a Stop of leifurely telling One, the *Semicolon* Two, the *Colon* Three, and the *Period* Four.—And are made to mark'd thus:

Comma (,) at the Foot of a Word.
Semicolon (;) a Point over the Comma.
Colon (:) two Points.
Period (.) a fingle Point at the Foot of a Word.

, *Example of the* Comma.) There is not any thing in the World, perhaps, that is more talk'd of, or lefs underftood, than the Bufinefs of a happy Life.

; *Example of the* Semicolon.) It is not a Curfe that makes way for a Blefling; the bare Wifh is an Injury; the Moderation of *Antigonus* was remarkable.

: *Example of the* Colon.) A found Mind is not to be fhaken with popular Applaufe: But, Anger is ftartled at every Accident.

. *Example of the* Period.) It is a Shame, fays *Fabius*, for a Commander to excufe himfelf, by faying, I was not aware of it. A Cruelty that was only fit for *Marius*, to fuffer, *Sylla* to command, and *Catiline* to act.

By the Examples foregoing, we may eafily note, that a *Comma* is a Note of a fhort ftay between Words in the Sentence; and therefore the Tenor of the Voice muft ftill be kept up.————The *Semicolon* is a little longer, and the Tone of Voice very little abated.————The *Colon* fignifies perfect Senfe, but not an End of the Sentence; and the Voice a little abated or let fall.————The *Period* denotes perfect Senfe, and the End of the Sentence.

When the Queftion is afked, there is a crooked Mark made over the Period thus ? and is called a Note of Interrogation: *Example*, What could be happier than the State of Mankind, when People lived without either Avarice or Envy? The Time of Paufe for this Stop, is the fame with the *Semicolon*.

If a fudden Crying out, or Wondering, be expreffed, then this Mark is made over the full Stop, thus ! and called

a

a Note of Admiration, or Exclamation: *Example*, Oh the astonishing Wonders that are in the elementary World!

( ) If one Sentence be within another, of which it is no Part, then 'tis placed between two Semicircles or Parenthesis, made thus ( ): *Example*, *Pompey* on the other side (that hardly ever spake in publick without a Blush) had a wonderful Sweetness of Nature. Again, Of Authors be sure to make choice of the best, and (as I said before) to stick close to them. Once more; Honour thy Father and Mother (which is the first Commandment with Promise) that it may be well with thee.———In reading a Parenthesis, the Tone must be somewhat lower, as a Thing or Matter that comes in by the bye, breaking in as it were on the main Coherence of the Period. The Time is equal to a Comma, and ought to be read pretty quick, lest it detain the Ear too long from the Sense of the more important Matter.

' *Apostrophe*, is a Comma at the Head of Letters, signifying some Letter or Letters left out for quicker Pronunciation, as *I'll* for *I will*, *would'st* for *would'st*, *sha'n't* for *shall not*, *ne'er* for *never*, *is't* for *is it*, *'tis* for *it is*, *i'th'* for *in the*, *o'er* for *over*: Or to denote a Genitive Case; as my Father's House, my Uncle's Wife, &c.

' *Accent* is placed over a Vowel, to denote that the Stress or Sound in Pronunciation is on that Syllable.

ˇ *Breve*, or crooked Mark over a Vowel, signifies it must be sounded short or quick.

. *Caret* signifies something is wanting, and is placed underneath the Line, just where any Thing is omitted, by Mistake or Forgetfulness, &c. should be brought in.

' *Circumflex* is of the same shape with the Caret, but placed over some Vowel, to shew the Syllable to be long, as *Eu-phrá-tes*.

¨ *Dialysis*, or two Points placed over two Vowels in a Word, signifies they are to be parted, being no Diphthong.

- *Hyphen*, or *Note of Connexion*, is a straight Line; which being set at the End of a Line, shews that the Syllables of that Word are parted, and the Remainder of it is at the Beginning of the next Line; and sometimes is used in compound Words, as Burnt-sacrifices, Heart-breaking, Soulhealing, Book-keeper, &c. *N. B.* That when you have not room to write the whole Word at the End of a Line, but are obliged to finish it the Beginning of the next, such Words must be truly divided, according to the Rules of our Spelling

Spelling; as re-ftrain, not ————————————— ref-ftrain. When the 'Hyphen is placed over a Vowel, it is properly a Dafh, and fignifies the Omiffion of *m* or *n* ; 'tis much ufed in old *Latin* Authors, and fometimes in *Englifh*, efpecially in Law-Bufinefs. *Example* ; It is very com̅edable to write a good Hand.

☞ *Index*, is a Note like a Hand, pointing to fomething very remarkable.

* *Afterifm* or *Star*, directs to fome Remark in the Margin, or at the Foot of the Page. Several of them together denote fomething defective, or immodeft, in that Paffage of the Author.

† *Obelifk*, is a Mark like a Dagger, and refers to the Margin, as the *Afterifm* * : And in Dictionaries, it fignifies the Word to be obfolete, or old, and out of ufe.

¶ *Paragraph*, denotes a Divifion, comprehending feveral Sentences under one Head.

§ *Section*, fignifies the Beginning of a new Head of Difcourfe, and is ufed in fubdividing a Chapter, or Book, into leffer Parts or Portions.

[ ] *Brackets* or *Crochets*, generally include a Word or Sentence, explanatory of what went before ; or Words of the fame Senfe, which may be ufed in their ftead.

" *Quotation*, or double Comma reverfe, is ufed at the Beginning of the Line, and fhews what is quoted from an Author to be in his own Words.

Thus much for Pointing, Stops, and Marks ; which, if carefully heeded and obferved, will add Grace and Credit to your Writing.

Of Abbreviations.

To be ready in thefe, fhews a Dexterity in Writing ; and very neceffary for Difpatch : For by thefe, we expeditioufly exprefs, or fet down a Word, fhortening it, by making fome Initial Letter or Letters, belonging to the Word, to exprefs it ; as in the Table following,

A. For Anfwer or Afternoon

A. B. Arts Batchelor

A. Bp. Archbifhop

Acct. Account

A. D. Anno Domini, Year of our Lord

A. M. Anno Mundi, Year of the World

Admrs. Adminiftrators

A. M. Artium Magifter, Mafter of Arts

Ana, of each a like Quantity

Ap. April, or Apoftle

Ad--

Adm[1]. Admiral
Ag[t]. Againft
Am[t]. Amount
Anab. Anabaptift
Aug. Auguft
A. R. Anno Regni, in the Year of the Reign
Aft. P. G. Aftronomy Profeffor of Grefham College
Auft. Auftin, or Auftria
B. A. Bachelor of Arts
B. D. Bachelor of Divinity
B. V. Bleffed Virgin
Bart. Baronet
Bp. Bifhop.
C. Charles, or Chapter
Cant. Canticles, or Canterbury
Cat. Catechifm
Cha. Charles, or Charity
Chap. Chapter.
Cent. Centum
Ch. Church
Chanc. Chancellor
Chron. Chronicles
Capt. Captain
Clem. Clement
Col. Coloffians
Cl. Clericus
Co. Country
Col[l]. Colonel
Com[rs]. Commiffioners
Con. Conftance or Conftantine
Conf. Confeffor
Cou'd, for could
Cor Corinthians, or Corollary
Cr. Creditor
C. R. Carolus Rex, or Charles the King
C. C. C. Corpus Chrifti College
C S. Cuftos Sigilli, Keeper of the Seal

C. P. S. Cuftos Privati Sigilli, Keeper of the Privy Seal
D. Dean or Duke
Dan. Daniel
Dr. Doctor, or Debtor
Dea. Deacon
D[o]. Ditto
D. Denarii, Pence
Dec. Or xber, or 1ober, December
Devon. Devonfhire
Deut. Deuteronomy
Dec. Deceafed
D. C. Dean of Chrift Church
Doct. Doctrine
D. D. Doctor of Divinity
E. for Earl
Earld. Earldom
Edm. Edmund
Edw. Edward
E. gr. Exempli gratia, for Example
Engl. England
Eliz. Elizabeth
Efa. Efaiah
Eph. Ephefians
Eccl. Ecclefiaftes
Ex. Exodus, or Example
Ev. Evangelift
Exp. Explanation
Expo. Expofition
Efq; Efquire
Exon. Exeter
Fr. French or France
Feb. February
Fra. Francis
F. R. S. Fellow of the Royal Society
G. God, Great, or Gofpel
Ga. Galatians.
Gen. Genefis
Gen[mo] Generaliffimo
Geo. George

G. H.

G. R. Georgius Rex, George the King
Gar. Garrifon
Gen. General
Gent. Gentleman
Gofp. Gofpel
Greg. Gregory
Hen. Henry
Hamp. Hamper
Hund. Hundred
Hum. Humphry
Heb. Hebrews
i. e. id eft, that is
I. H. S. Jefus Hominum Salvator, Jefus Saviour of Men
Id. Idem, the fame
Inft. Inftance, or Inftant
Ja. James, or Jacob
Jan. January
Jer. Jeremiah
Jef. Jefus
Jo. John
Jud. Judges
If. Ifaac
I'll, I will
Is't, is it
I'd, I had
I'm, I am
J. D. Jurium Doctor, Doctor of Laws
Jof. Jofhua
K. King
Km. Kingdom
Knt. Knight
L. Lord
L. Liber, a Book
Lb. Libræ, Pounds
Lieu. Lieutenant
Lp. Lordfhip
Ladifhp. Ladyfhip
L. L. D. Legum Doctor, Doctor of Laws
Learng. Learning
Lon. London, *Longitude*

Lr. Letter
Lam. Lamentations
Lev. Leviticus
Let's, Let us
M. Marquis, or Monday, or Morning
Mar. March
Mat. Matthew
m. Manipulus, a handful
M. A. Mafter of Arts
Maty. Majefty
Md. Madam
Monf. Monfieur
Math. Mathematician
Mr. Mafter
Mrs. Miftrefs
M. D. Medicinæ Doctor, Doctor of Phyfick
M. S. Memoriæ Sacrum, Sacred to the Memory; alfo Manufcript
Mich. Michael, or Michaelmas
Min. Minifter
N. Note, or Nativity
Nat. Nathaniel, or Nativity
N. B. Nota bene, Note, or mark well
Nic. Nicholas, or Nicodemus
N. S. New Stile
No. Number
n. l. Non liquet, it appears not
Nov. or 9ber, November
O. Oliver
Obj. Objection
Obt. Obedient
O. W. Old Word
O. S. Old Stile
Oct. or 8ber, October
Oxon. Oxford
P. Paul, Paulus, Publius, or Prefident
Pugil, a Handful
Pen. Penelope
C

P

P^d. paid
Par. Parifh
p. per, or by
Pat. Patience, or Patrick
per C^t. per Centum, by the Hundred
Parl. Parliament
Pet. Peter
Phil. Phillipians, or Philip
Philom. Philomathes, a Lover of Learning
Philo-Math. Philo-Mathematicus, a Lover of the Mathematicks
P. M. G. Profeffor of Mufic at Grefham College
Prof. Th. G. Profeffor of Divinity at Grefham College
Prif. Prifcilla
Pr. Prieft
Pf. Pfalm
Q. Queen, or Queftion
q. quafi, as it were
q. d. quafi dicat, as if he fhould fay
q. l. quantum libet, as much as you pleafe
q. f. quantum fufficit, a fufficient Quantity
qr. Quarter, or a Farthing
R. Reafon
R. Rex, King; or Regina, Queen
Rev^d. Reverend
Rev. Revelations
Rich. Richard
Robt. Robert
Rog. Roger
Ret. Return
Reg. Prof. Regius Profeffor, founded by K. Henry VIII.
Rom. Romans
R^t Honble. Right Honourable
R^t Wp^l. Right Worfhipful
S^t. Saint

Sam. Samuel *e.*
Sect. Section
Sept. or *7ber.* September
Serj. Serjeant
Serv. Servant
Sh^r. Shire
Shan't, for fhall not
Salop. Shropfhire
Sol. Solution
Staff. Stafford
Sp. Spain, or Spanifh
S^r. Sir
fs. Semiffis, half a Pound
S. S. T. P. A Profeffor, or a Doctor of ~~Philofophy~~ ^ *Divinity*
Stew. Steward
Tho. Thomas
Thef. Theffalonians
The Theophilus
To. Tobias
V. Virgin, or Verfe
U. Ufe
Vid. fee
Ven. Venerable
Viz. Videlicet, to wit, or that is to fay
W^m. William
Wp. Worfhip
Wp^l. Worfhipful
W. R. William Rex
w^n. when
X^n. Chriftian
X^t. Chrift
Xtopher Chriftopher
ye the
y^n then
y^o you
y^m them
y^t that
y^r your
Z. Zeal
&, et, and
&c. & cætera, and the reft, or, and fo forth.

And

And now having finished my Directions concerning Spelling, Pointing, &c. I shall proceed to give some Instructions in relation to the most useful Art of Writing.

When any Person has thoroughly acquainted himself with Spelling, and understands good *English*, &c. the next Step necessary is the acquiring of the accomplishing Art of fair Writing, to put this Spelling in Practice : In order thereto I shall endeavour to give such Directions, and proper Instructions, as may duly qualify any Person therein.

First, and principally, there must be a fixed desire and Inclination imprinted in the Mind for its attainment : For I my self had never acquired, or arrived to any Proficiency in it, if I had not had a Strong Desire and Inclination to it ; rising from being convinced of its excellent Use in Trade, and all manner of Business, according to the Verse, —

> *Great was his Genius, most sublime his Thought,*
> *That first Fair Writing to Perfection brought,* &c.

Next to the Desire, there must be added a steady Resolution to go through with it, 'till it is gained ; and by a diligent and indefatigable Application, overcome all seeming Difficulties, that may arise in the Progress of its Attainment, agreeable to this Distich ;

> *By frequent Use, Experience gains its Growth ;*
> *But Knowledge flies from Laziness and Sloth.*

DIRECTIONS *to* BEGINNERS.

FIRST, 'tis necessary to be provided with the following Implements, *viz.* good Pens, good and free Ink, and also good Paper, when arrived to commendable Performances ; likewise a flat Ruler for Sureness ; and a round one for Dispatch ; with a Leaden Plummet or Pencil to rule Lines : Also Gum Sandrick Powder, (or Pounce as they call it) with a little Cotton dipp'd therein, which rub gently over the Paper, to make it bear Ink the better ; particularly when full Hands are to be written, such as Text, &c. and especially when you are obliged to scratch out a Word or Letter ; for then there will be a Necessity for its Use ; and rubbing the Place with the Pounce, smooth it with the Haft of the Penknife, or clean Paper, and then you may write what is proper in the same Place. These Implements are summ'd up in these Lines :

A Penknife Razor Metal, Quills good store ;
Gum Sandrick Powder, to pounce Paper oe'r ;
Ink, shining black ; Paper more white than Snow,
Round and flat Rulers on yourself bestow,
With willing Mind, these, and industrious Hand,
Will make this Art your Servant at Command.

To hold the Pen.

THE Pen must be held somewhat sloping, with the Thumb and the two Fingers next to it ; the Ball of the Middle Finger must be placed strait, just against the upper Part of the Cut or Cradle, to keep the Pen steady The Fore-Finger lying strait on the Middle Finger ; and the Thumb must be fixed a little higher than the End of the Fore-Finger, bending in the Joint ; and the Pen be so placed, to be held easily without griping. The Elbow must be drawn pretty close to the Body, almost to touch it. You must support your Hand by leaning on the Table-Edge, resting on it, half way between your Wrist and Elbow, not suffering the Ball, or fleshy Part of your Hand to touch the Paper ; but resting your Hand on the End of your Little Finger, that and your Fourth Finger bending inwards, and supported on the Table as abovesaid. So fixed, and sitting pretty upright, not leaning your Breast against the Table ; proceed to the making the small *o*, the *a, e, c, i, m, r, s, w*, and *x* ; which must be all made of equal Bigness and Height ; the Distance or Width between the two Strokes of the *n*, must be the same with the Distance or Width of the three Strokes of the *m* ; the same Proportion of Width must be observed in the *u, w*, and *o*. The Letters with Stems or Heads, must be of equal Height ; as the *b, d, f, h, k, l*, and *f*. And those with Tails, must be of equal Depth, as the *f, g, p, q*, and *f*. The Capitals must bear the same Proportion one to another, with respect to Bigness and Height, as *A, B, C, D, E, F, G, H*, and *I, &c.* ─ This Proportion of Letters, both of Small and Great, must be observed in, and will serve for, all Hands whatsoever. *N. B.* That all upright Strokes, and those leaning to the left Hand, must be fine or hair Strokes ; and all down-right Strokes, must be fuller or blacker. And when you are in Joyning, where Letters will naturally join, without any straining, take not off the Pen in Writing, especially in Running or Mix'd Hands. Care likewise must be duly taken, that there be an

equal

equal Diſtance between Letter and Letter, and alſo between Word and Word : The Diſtance between Word and Word, may be the Space that the ſmall *m* takes up ; but between Letter and Letter, not quite ſo much. Sit not long at writing (that is, no longer than you improve) eſpecially at the firſt, leſt it weary you, and you grow weary of Learning. Imitate the beſt Examples ; and have a conſtant Eye at your Copy ; and be not ambitious of writing faſt, before you can write well : Expedition will naturally follow, after you have gained a Habit of writing fair and free ; and 'tis much more commendable to be an Hour in writing ſix Lines well, than to be able to write ſixty Lines in the ſame Time, which perhaps is perfeċt Scribble, and altogether unintelligible. And beſides, by a ſlow and fair Procedure, you will learn in half the Time : And therefore 'tis a vain Thought in a Learner, to deſire to be quick before he hath acquired Experience, and a Freedom of Writing by frequent Praċtice. If you have Cotton in your Ink, look well that there be no Hairs at the Nib of your Pen. Never overcharge your Pen with Ink ; but ſhake what is too much into the Ink again. When you leave off, keep your Pen or Pens in Water, 'till you come to your Writing again.

How to make a Pen.

THIS is gained ſooner by Experience, and Obſervation from others that can make a Pen well, than by Verbal Direċtions. But *Note,* That thoſe Quills call'd *Seconds* are the beſt, as being hard, long and round in the Barrel ; and before you begin to cut the Quill, ſcrape off the ſuperfluous Scurf with the Back of your Pen-knife, and moſt on the Back of the Quill, that the Slit may be the finer, and without Ganders Teeth (as the Roughneſs in the Slit is by ſome called.) After you have ſcraped the Quill as aboveſaid, cut the Quill at the End, half through, on the back Part ; and then turning up the Belly, cut the other half or Part quite through, *viz.* about a quarter or almoſt half an Inch, at the End of the Quill, which will then appear forked : Then enter the Pen-knife a little in the back Notch ; and then putting the Peg of the Pen-knife Haft, (or the End of another Quill) into the back Notch, holding your Thumb pretty hard on the Back of the Quill, (as high as you intend the Slit to be,) then with a ſudden or quick Twitch, force up the Slit ; it muſt be ſudden and ſmart, that

Slit may be the clearer: Then by several Cuts of each Side, bring the Quil into equal Shape, or Form, on both Sides; and having brought it to a fine Point, place the Inside of the Nib on the Nail of your Thumb, and enter the Knife at the Extremity of the Nib, and cut it through a little sloping: Then with an almost downright Cut of the Knife, cut off the Nib; and then by other proper Cuts, finish the Pen, bringing it into handsome Shape, and proper Form: But meddle not with the Nib again, by giving it any Trimming or fine Cuts; for that causes a Roughness, and spoils it: But if you do, to bring the Nib the evener, you must nib it again, as above directed. ☞ *Note,* That the Breadth of the Nib must be proportion'd to the Breadth of the Body, or down-right black Strokes of the Letters, in whatsoever Hand you write, whether Small or Text. *Note also,* That in your fitting to write, you place yourself directly against a fore-right Light, or else to have it on your left Hand (which I esteem best) but by no Means to have the Light on your right Hand, because the Shadow of your Writing-Hand will obstruct your Sight, and therefore is very improper. And therefore, methinks, all Persons in fixing up their Accounting-Houses, should have a particular Regard to their Situation, in respect to what was before mention'd.

Thus far for Direction. Now for Application. I have here set Copies of the most usual, fashionable, and commendable Hands for Business; with Alphabets of great and Small Letters, proper to each. Be sure you make your Letters well, (both Small and Great) before you proceed to joining. Be careful in Imitation, and observe the foregoing Directions, and without doubt you will gain your End. Command of Hand, or the Art of striking Letters, &c. is gained by frequent practising after good Examples.

A

ABCDEFGHIJKLMN
OPQRSTUVWXYZÆ

abcdefghijklmnopqrſs
tuvwxyz&

C 4

N. B. 'Tis neceſſary for all thoſe who would qualify themſelves for Buſineſs, often to imitate this Print-Hand ; to make clean Marks on Bales, or Plain Directions on Parcels.

Copie

Copies in Profe, and clinking, in Alphabetical Order.

A.

ART is gained by great Labour and Induftry.
   A covetous Man is always, as he fancies, in want.
Add to your Faith Virtue, and to Virtue Knowledge.
A blind Man's Wife, they fay, needs no Painting.
A comely Countenance is a filent Commendation.
A Place of ill example may endanger a good Man.
A prudent Man values Content more than Riches.
A virtuous Mind is rather to be chofen than Promotion.
A fair Piece of Writing is a fort of fpeaking Picture.
All mundane Things run a continual Round.
Authority is the main Point in Government.
All God's Commandments keep moft divinely pure.
A Man's Manners oft-times forms his Fortune.
A great Lyar is feldom believ'd, tho' he fpeaks Truth.
All evil Things and vain, ftrive ever to refrain.
A virtuous minded Youth, will ever love the Truth.
A prudent Youth and wife, will not Advice defpife.
All you that write well, ftrive others to excel.
Abundance ruins fome, but Want makes all to moarn.
Amendment ftill fhould fhine, in all and every Line.
A greater Lofs can't be, than that of Liberty. —
A good and virtuous Lad, will fhun whate'er is bad.
Abundance proves a Snare, but moft of Want are aware.
All Idlenefs avoid, by it moft are deftroy'd.
All idle lazy Boys, obftruct their Parents Joys.
A Man by Conduct may, keep Mifery away.
All Mif-hap hath been, occafion'd by our Sin.
Avoid th' Occafion ftill, of running into ill.
A Youth that would tranfcend, muft ever mind to mend.
A Lad to that would excel, muft mind his Copy well,

B.

Bounty is commendable in fome, but it ruins others.
By a commendable Deportment, we gain Reputation.
By Delight, and fome Care, we come to write fair.
By Diligence and Induftry we come to Preferment.
Beauty without Virtue, is but a painted Sepulchre.
Beauty commands fome, but Money all Men.
By conftant Amendment we rife to Preferment.
Brave Men will do nothing unbecoming themfelves.
Be wife and beware ; of blotting take Care.

Bounty is more commended than imitated.

By Iniquity and Sin, Misfortunes enter in

By Idleness and Play, Youth squander Time away.

Barren are those Joys, we waste away in Toys.

Bless'd are their Joys above, who do their Time improve.

Sadness brings all Sadness, therefore follow Goodness.

By trusting to To-morrow, Men plunge themselves in Sorrow.

Be wise betimes ; shun darling Crimes.

C.

Contentment is preferable to Riches and Honour.

Can they be counted wise, who Counsel do despise ?

Care mixed with delight, will bring us soon to write.

Consider the Shortness of Life, and Certainty of Death.

Contentment is a Gem, beyond a Diadem.

Competency with Content is a great Happiness.

Contention and Strife, make uneasy our Life.

Courtiers receive Presents in a Morning, and forget 'em
by Night.

Caution and Care, oft baffle a Snare.

Contentment makes a Man happy without a Fortune.

Censure no Man, nor detract from any Man.

D.

Deride not Infirmities, nor triumph over Injuries.

Delight and some Care, will make you write fair.

Delight in Virtue's Ways, and then you'll merit Praise.

Death conquers potent Princes, and their Powers.

Delight in what you undertake to learn.

Duty, Fear, and Love, we owe to God above.

Death is before the old Man's Face, and may be at the
(young one's Back.

Death only can declare, what Dust the Bodies of all Mor-
tals are.

Drinking is the Drowning of Cares, not the Cure of them.

Death destroys not the Soul, but an ill Life does.

Do to others as you would, that they unto you should.

Delay is the Remora to all good Success.

Deprive no Person of his lawful Due, left they should do
(the same by you.

Delight and Pleasure's but a Golden Dream.

Death is less fear'd by a Fool than a Philosopher.

E.

Endless Joys have those, whose Sins are vanquish'd Foes.

Every Plant and Flower, shews to us God's Power. —

C 5   Exampl:

Example oft doth rule, the wife Man and the Fool.
Examples oft prevail, when Arguments do fail.
Every idle Thought, to Judgment muſt be brought.
Every Sluggard is the Cauſe of his own Misfortune.
Envious Men do fret, when they ſee others get.
Evil Company makes the good bad, and the bad worſe.
Experience is the beſt Looking-Glaſs of Wiſdom.
Even at Head and Feet, be ſure your Letters keep.
Endeavour to do well, and then you may excel.
Every Man is right, that mixes Profit with Delight.
Evil Men and ſly, take care how you come nigh.
Envy and Care, make the Body grow ſpare.
Every money'd Man, hath others at Command.

F.

Fair Words commonly dreſs foul Deeds.
Fair Faces have ſometimes foul Conditions.
Few do Good with what they have gotten ill.
Future Events muſt be left to Providence.
Fools are rul'd by their Humour, but wiſe Men by Intereſt.
Firm keep your Mind, on Things that are ſublime.
Fear is a good Watchman, but a bad Defender.
Fate will ſtill have, a kind Chance for the Brave.
Fraud in Childhood will become Knavery in Manhood. —
Fear without Hope turns to Deſpair.
Faith and Hope are both Dead when divided.
Fortune at ſome Hours to all is kind. —
Feign'd Looks oft hide what the falſe Heart doth know.
Fortune and Fame, create a great Name.
Friends in Adverſity are not often found.
Fools and Knaves are not Companions for honeſt Men.
Frugality and Induſtry are the Hands of Fortune.

G.

Godlineſs with Contentment is great Gain.
Good Manners in a Lad, will make his Parents glad.
Great Minds and ſmall Means ruin many Men.
Good Manners, Grace and Truth, are Ornaments in Youth.
Good Men as well as bad, have ſometimes Fortunes ſad.
Great Good you ſure will find, if you are well inclin'd.
Godlineſs hath the Promiſe of the Life that now is, &c.
God's Works only are perfect in their Kind.
Gluttony ranſacks *Noah's* Ark for the Riot of a Meal.
Grief nouriſh'd in your Breaſt, will never let you reſt.
Greater Profit doth always come of Learning than of Play.

Great

Great men tho' they fhou'd, are not always good.
Good Men are fafe, when wicked ones are at odds.
Get what you get honeftly, and ufe it frugally.
God is Omniprefent, True, and Almighty.

H

Hafty Refolutions are feldom fortunate.
Hafte makes wafte of Paper, Ink and Time.
He that ftumbles, and falls not, mends his Pace.
Honour and Renown, will the Ingenious crown.
Hypocrites firft cheat the World, and at laft themfelves.
Human Life will human Frailties have.
Honour that is true, 'tis lawful to purfue.
He that fends a Fool of an Errand, ought to follow him.
Honours are Burthens, and Riches have Wings.
He is a wife Security that fecures himfelf.
He that fins againft Confcience, fins with a Witnefs.
Honour the hoary Head, that Virtue's Paths do tread.
Happy are their Joys, who turn away from Toys.
Hours fly fwift away ; improve each Moment in the Day.
He that fwims in Sin, muft fink in Sorrow.
He that fears not an Oath, will not tremble at a Lye.
He hath his Work half done, that hath it well begun.

I

Inftruction, and a good Education, is a durable Portion.
Ignorance is the greateft Enemy to Learning.
In praifing fparing be, and blame moft fparingly.
Imaginary Toys, do pleafe fome idle Boys.
Intemperance is attended by Difeafes, and Idlenefs with Want.
It is good to have a Friend, but bad to need him.
Idlenefs and Sloth, decreafeth Learning's Growth.
Innocency, need not fear the Lion, or the rugged Bear.
It is better to be unborn, than untaught.
It's too late to fpare, when the Bottom is bare.
Idlenefs hath no Advocate, but many Friends.
Improvement of Parts, is by Improvement of Time.
If you'd win a Pen of Gold, firft learn well the Pen to hold.
It's the Work of an Age, to repair the Mifcarriage of an Hour.

K

Keep a clofe Mouth, if you'd have a wife Head.
Kings, as well as mean Men, muft die.
Kings may command, and Subjects muft obey.
Kingdoms and Crowns muft in the Duft be laid.
Knowledge fublime, is gained by much Time.

Keep at at Diſtance from Company that's ill.
Keep good Decorum in your Words and Deeds.
Keep cloſe your Intention, for Fear of Prevention.
Kings may win Crowns, but cannot conquer Death.
Keep Faith with all Men, and have a Care of a Lie.
Keep good Company, if you'd keep a good Name.
Knowledge if abus'd, is like a Gem ill us'd.
Kingdoms bring Care, and Crowns are heavy Things to wear.
Keep out evil Thoughts by entertaining good ones.
Kind Actions neglected, make Friendſhip ſuſpected.
Keep ſafe good Counſel, and entertain not ill Advice.
Kindle not Paſſion's Fire, it burns with dreadful Ire.

L.

Learn to live, as you would wiſh to die.
Love and Honour will bear no Rivals.
Learn to unlearn what you have learn'd amiſs.
Learn now in Time of Youth, to follow Grace and Truth.
Liberty is grateful to all, but deſtructive to many.
Lying is the Duty of none, but the Cuſtom of many.
Learning do but love, and then you will improve.
Liberality without Diſcretion, becomes Profuſeneſs.
Let no Jeſt intrude upon good Manners.
Learn now in youthful Prime, to huſband well your Time.
Learn how to make as well as uſe a Pen.
Liberality ſhould have no object but the Poor.
Loſt Opportunities are very rarely, if ever recovered.
Let not the Work of To-day, be put off 'till To-morrow.
Laugh not out of Meaſure, nor out of Seaſon.

M.

Money makes honeſt Men and Knaves, Fools and Philo-
(ſophers.
Monuments of Learning are the moſt durable.
Many know Good, but do not the Good they know.
Make uſe of Time now whilſt you're in your Prime.
Money commonly corrupts both Church and State. ━
Many think not of living, 'till they can live no longer. ⌐
Money pleads all Cauſes, and defends all Titles.
Many when they have fill'd their Bellies, complain of
weak Stomachs.
Meaſure not Goodneſs by good Words only.
Marriage is out of Seaſon, if we are either too Young or
(too Old.
Moſt precious Time eſteem, which no one can redeem.
Many

Many live Beggars all their Lives, that they may not die fo.
Money makes fome Men mad, many merry, but few fad. —
Many are led by the Ears more than by the Underftanding.
Moft precious Things are ftill poffefs'd with Fear.
Many are made Saints on Earth that never reach Heaven. —
Men of Intrigue commonly fail with all Winds.
Money anfwers all Objections, and removes all Scruples.
Money and Poverty make great Knaves and little ones.
Misfortune is the Touchftone of Friendfhip. —
Marriage, fay fome, breeds Cares and cuckolds.
Mend your Manners, and that will mend your Fortune.
Many want Help that have not the Face to afk it.
Momentary and vain, is all earthly Gain.

N.

Nothing is conftant in this Uncertain World.
Neceffity is commonly the Mother of Invention.
Next to a good Confcience, prefer a good Name.
None fo high can be, as no Mif-hap to fee.
Nothing is fo hard but Diligence may overcome.
No Tafk's too hard, when Heaven's the Reward.
None can lay himfelf under an Obligation to do ill. —
Never lament or weep, for Lofs of what you cannot keep.
Noife and Talk without fome Rule, doth indicate that Man
(a Fool.
Nature feldom changes with the Climate.
Never ftudy to pleafe others, and thereby ruin yourfelf.
Nature oldeft Law we find, is that we to ourfelves be kind.

O.

Opportunity neglected brings fevere Repentance.
On prefent Time depends our future State.
Opus and *Ufus*, as we read, are fometimes Latin for our Need.
Of what gives moft Delight, we foonet lofe the Sight.
Omitting doing Good, is a committing Evil.
Orators are more folicitous to fpeak *well* than to do fo.
Our Sand doth run apace, and foon we end our Race.
Our Inclinations get the Rein, to gain a Point we fhould
(reftrain.
Our Minds muft be cultivated, as well as our Plants.
Other People's Death fhould be Memento's to our own.
Our early Care fhould be, to live moft pioufly.
Our Time of Life is call'd a Span, by which obferve how
(frail is Man.
One falfe Step, fometimes prevents another.

P.

P.

Provide against the worst, and hope for the best.
Poor Men want many Things, but covetous Men all.
Patience and Time run thro' the roughest Day.
Put to your Tongue a Bridle, that it talk not idle.
Pain, Disgrace and Poverty, have frightful Looks.
Prayers and Provinder hinder no Man's Journey.
Put not off the main Business of Life, to the very Article of
(Death.

Pain we can count, but Pleasure steals away.
Poor Freedom is better than rich Slavery. —
Patience is the Lord of the lean Meat of Adversity.
Passion and Partiality govern in too many Cases.
Perfection in this World, is Virtue; and in the next, Know-
(ledge

Q.

Quick Promisers are commonly slow Performers.
Quietness and Content are Mates most excellent.
Qualify exorbitant Passions with Quietness and Patience.
Quiet Men have quiet Minds, and enjoy Content.
Quicken Learning with Alacrity and Delight.
Quarrelsome Persons sometimes meet with their Match.
Quot Homines tot sententiæ, so many Men, &c.
Quills are made for Pens, and Pens for Letters.
Quietly learn to bear a Cross; if we repine, it's to our Loss.
Questions in Jest, no serious Answers need.
Quench Passion's Heat; don't suffer it to reign.
Quantity with some is what they'd hit; but Quality prevails
(with Men of Wit.

R.

Remember your Duty to God, your Neighbour, and yourself.
Repentance comes too late, when all is consumed.
Reason should always guide, and o'er our Acts preside.
Reputation is the Darling of human Affection.
Rest continu'd long, makes Idleness grow strong.
Rely on Virtue more than Blood, for that is what you shou'd,
Repent To-day, To-morrow may be too late.
Reputation is like a Glass when crack'd, it will be crazy.
Reputation is gain'd by many Actions, and lost by one. —
Remember Death, and do not forget Judgment.
Religion in Hypocrites, is as it were but Skin deep. —
Relations and Friends, pursue their own Ends.
Riches serve a wise Man, and rule a Fool.

Religion

...eligion hath and doth give Countenance to much Wickedness.
...iches serve a wise Man, and rule a Fool.
...un no great Risque for 'vantage small, tho' some for Mo-
(ney hazard all.
...eason's Dictates follow still ; which if you do, *you'll* ne'er
(do *ill.*
...ighteous Mens Prayers *shall* be regarded.
...epentance is a quite forsaking Sin ; but he repents not that
(remains therein.
...esolve to amend, and pursu't to your End.
...eview the Time you have mispent ; think upon it, and
(lament.
...ecreation should fit us for Business, not rob us of Time.

S.

Sin and Sorrow are inseparable Companions.
Some are too stiff to bend, and too old to mend.
Some *willinglier* discharge a Reckoning, than pay a Debt.
Sin is most certain, first Cause of Misfortune.
Study to live quiet, and to do your own Business.
Some in their Zeal are hot, but Knowledge they've not.
Set Bounds to Zeal by Discretion.
Silence is the Sanctuary of Prudence and Discretion.
Sloth is an Argument of a mean and degenerate Mind.
Short, and therefore vain, is *all* Earthly Gain.
Soft Words, sometimes, work upon the proudest Heart.
Sleep and Idleness are Enemies to Learning.
Sin is the Cause of Shame ; who love it are to blame.
Small Means and large Minds, ruin many Men.
Short are *all* Extreams, whether of good or *ill.*
Spend Time in good Duties, and Treasure in good Works.
Some go fine and brave, finely to play the Knave.
Six Foot of Earth, ends *all* Distinctions of our Birth.
Some must die, that others may live, said the Grave-digger.
Silly People are commonly *pleas'd* with *silly* Things.
Some are *full* of *oral* Sanctity, and *mental* Impiety.
Small Profit comes from *all ungodly* Gain.

T.

Train up a Child in the Love and Practice of good Manners,
The End of Mirth is many Times the Beginning of Sorrow,
Time is so swift of Foot, that none can overtake it.
Time passeth swift away, no Mortal can it stay.
Time passeth swift away, improve therefore each Day.
The doing nothing, is very near doing Evil.

Those

Those who won't 'mend To-day, *shall* have more Work
(To-morrow
The Borrower is a Slave to the Lender ; and the Security
(Slave to both
Truth is the strongest Bands of human Society.
The Endowments of the Mind ought not to be confin'd.
There's no discerning Pate, that can contend with Fate.
The Destruction of the Poor is their Poverty.
The City cares not what the Country thinks.
To do good, is the Way to find it, 1741.
'Tis just so much lost as is idly spent.
There is no such Thing in Nature as Perfection.
Time, Tide, and Carriers, *will* for no Man stay.
The Unfortunate are insulted by every Rascal.
'Tis inhuman to sport with another's Infirmities.

V.

Virtue is first to be sought for, and Money the next.
Vain and transitory, is all mundane Glory. 1741.
Virtue and Fortune work wonders in the World.
Value more a good Conscience than a great Fame.
Unwillingly go to *Law*, and *willingly* make an End.
Understanding a Thing is half doing it.
Variety is the Happiness of Life.
Virtuous and brave Actions gain Reputation.
Use soft Words, and hard Arguments
Virtue is commended of *all*, but *follow'd* by few.
Unthankfulness is the Cause of the Earth's Unfruitfulness.
Vain Conceitedness is ridiculed by *all*.
Virtue is seldom found a Match for Power.
Understand Things not by their Form, but Quality.
Virtue *all* commend, but few do it attend.
Union and Peace, make Discord to cease.
Valour and Greatness, are prefer'd before Neatness.
Vain and foolish Things, Disreputation bring.
Virtuous Actions *will*, bring Reputation *still*.

W.

What is more vain than publick Light to shun.
Who fears no bad, stands most unarm'd to *ill*.
What pleases God must be, none alters his Decree.
We are many Times deceiv'd with the bare Shew of Good.
Women and Wine, tho' they smile, they make Men pine.
When Fortune knocks, be sure to ope the Door.
Wine is a Turn-coat ; first a Friend, then an Enemy.

What

That is violent is seldom permanent. *l.* 4. 16. 9.
When good cheer is lacking, our Friends *will* be packing.
We dance *well*, while Fortune plays on the Musick.
We keep a better Account of our Money than our Time.
Wickedness in jest, leads us to Wickedness in earnest.
We must not blame Fortune for our own Faults.
Where Knavery is in Credit, Honesty is put out of Counte-
(nance.
We must *look* to Time past, to improve what's to come.
What is fixed in our Hearts, is seldom out of our Heads.
Wickedness comes on by Degrees, as *well* as Virtue.
Would you be rich, be industrious ; if wise, be studious.

X.

Xenophon was a great Captain, *as well* as a Philosopher.
Xerxes wept at the Thoughts that his vast Army would be
(dead in 100 Years.
Xerxes whipt the Sea because it would not obey his Command.
Xenocrates, tho' a Philosopher, was very *dull* and *heavy*.
Xenophilus liv'd without Sickness one hundred and seven Years.
Xamples of the best for ever mind, and imitate in kind.
Xpell bad Thoughts, and what is Sin, forth of your Mind,
(and let what's good come in.
Xamine *well* how you improve, for that *will* be as you
(your Learning love.
Xercise will much Improvement gain.
Xperience is the Mistress of all Arts and Sciences.
Xcell in what you can and strive to lead the Van.
Xpress your Desire to learn by your Diligence.

Y.

Youth is full of Disorder, and Age of Infirmity.
Young Men lament, your Minutes mispent.
Your Time improve, and squander't not away.
Your Spelling mind and Sense of what you write.
Yeild quietly to what must come unavoidably.
Young Men in Strength should provide against Age and
(Weakness.
Youth in their Prime, should manage *well* their Time.
Youth to the Grave do go, as *well* as the Aged do.
Yield yourself Servant to Righteousness and to Holiness.
Your Copy mind, write fair, and of blotting beware.
Your Care should appear by writing most fair.
Your Delight and your Care will make you write fair.

Z.

Z.

Zeal in a good Cause, commands Applause.
Zeal mixt with Love, is harmless as the Dove.
Zealously strive, with Emulation write.
Zealously strive for an eternal Crown.
Zeno was the first of the Stoic Philosophers.
Zeal without Knowledge is but Religious Wild-fire.
Zaccheus he was low, but yet his Faith wa'n't so.
Zeal, if not rightly directed, is very pernicious.
Zealously bend amain, fair Writing to attain.

Short Lines for Text-Hand.

Abandon whatsoever's Ill——Be Wise betimes.
Care destroys the Body—Do the Things that are just.
Expect to receive as you give—Frequent good Company.
Give what you give chearfully—Have good Men in Esteem
Imitate that which is good—Keep God's Commandments.
Learn to be wise—Money answers all Things.
Nothing get, nothing have—Observe Modesty.
Pleasures are very short—Pains are very long.
Quit all Revenge—Quiet your Passions.
Recompence a good Turn—Repent of your Sins.
Spare for to live——Sin very little.
Time well improve—Turn from your Sins.
Use moderate Pleasure—Use not bad Company.
Vain are some Pleasures——Vile are some Vulgar.
Wisdom is the principal Thing——Wise Men are scarce.
Xenophon and *Xenocrates*——*Zeno* and *Zenobia.*

Double Lines in Verse.

All you that in fair Writing would excel,
How much you write, regard not, but how well.
Bear your Pen lightly, keep a steady Hand,
And that's the Way, fair Writing to command.
Carefully mend in each succeeding Line,
For that's the Way to reach to what is fine.
Descending Strokes are dark, but upwards small ;
Even at Head and Feet keep Letters all.
From Blots keep clean your Book ; and always mind
To have your Letters all one Way inclin'd.
Grace every Letter with perfect, full and small,
And keep a due Proportion in them all.

Hold your Pen lightly, gripe it not too hard ;
And with due Care your Copy well regard.
Join every Letter to its next, with Care,
And let the Stroke be admirably fair.
Keep a light Hand, and smoothly glide along ;
Ascending fine, and downward Strokes are strong.
Let graceful Beauty in each Line appear,
And see the Front do not excel the Rear,
Majestick Grace, beautiful and strong,
Doth, or else ought, to every Line belong.
No rough Edges ever should be seen ;
But all the Letters should be smoth and clean.
On Care depends the Beauty of each Line,
For that alone will make your Art to shine.
Praise is deserving to the careful Hand,
But to the Unthinking, doth Correction stand.
Quit yourself nobly, with a prudent Care,
Of clumsey writing, and of Blots beware.
Remember strictly what the Art enjoins,
Equal siz'd Letters, and as equal Lines.
Small Letters must of equal Height be seen ;
The same of Great ; both beautifully clean.
Time and Delight will easy make the Task :
Delight, Delight's the only Thing I ask !
Vain are the Hopes of those that think to gain
This noble Treasure, without taking Pain.
Whilst idle Drones supinely dream of Fame,
The industrious actually do get the same.
Examples of the best, with Emulation strive
To imitate, and then your Name'll survive.
Youth is the Time for Progress in all Arts ;
Then use your Youth to gain most noble Parts.
Zeal for Attainment of each Art should burn
With fervent Warmth, then to Account 'twill turn.

Since good Ink is necessary to good Writing, I shall give
a Receipt or two for making some of the best Black Ink in the
World, which is as follows, *viz.*

A Receipt for black Ink.

TO six Quarts of Rain or River Water (but Rain Wa-
ter is the best) put one Pound and a half of fresh blue
Galls of *Aleppo* (for those of *Smyrna* are not strong enough)
bruized

bruised pretty small ; 8 Ounces of Copperas, clean, roo
and green ; also 8 Ounces of clean, bright, and clear G
Arabick ; and 2 Ounces of Roche Allom : Let these fi
together in a large Stone Bottle, or clean Stone Pot,
earthen Pot, with a narrow Mouth to keep it free fi
Dust ; shake, rowl, or stir it well, once every Day,
you will have excellent Ink in about a Month's Time ;
the older it grows, the better 'twill be for Use.

Ingredients for a Quart.

1 Quart of Water, 4 Ounces of Galls, 2 Ounces of C
peras, and two Ounces of Gum, mix'd and stirred as abov

☞ If you soak the green Peeling of *Wallnuts* (at
Time of the Year when pretty ripe) and Oak Saw-du
small Chips of it, in Rain Water, and stirr'd pretty
for a Fortnight, and then strain'd, and the Water used
the same Ingredients as above, the Ink *will still* be stro
and better.

How to make Red Ink.

TAKE 3 Pints of Stale-Beer (rather than Vine
and 4 Ounces of Ground *Brazil* wood ; simmer t
together for an Hour ; and then strain it thro' a Flannel,
&c. then bottle it up (well stopped) for Use.

Or you may dissolve half an Ounce of *Gum Stennega,*
Arabick, in half a Pint of Water ; then put a Penniw
of *Vermilion* into a small Gallipot, and pour some of
Gum-Water to it, and stir it well, and mix it together
a Hair-pencil, to a proper Consistency ; but it will not
corporate presently, but by the next Day it will ; then
ing a clean Pen, dip it into the Ink, having first well
red it with the Pencil, and then you may use it : It is a
and curious Red, tho' not so free as the other. And a
the same manner, you may make any other coloured
as Blue, Green, Yellow, Purple, *&c.* having divers Ga
pots for that Use. In like manner you may mix the *Sh*
Gold, for curious Occasions, pouring two or three Dr
according to Direction, into the *Shell,* and mix it *well*
a clean Hair Pencil, and with it put a little into a cl
Pen, *&c.* The *small Shells* may be bought at some *Fan*
lers or *Fan-painters,* at two or three for Two-pence ; or
large ones (which are the best) at the *Colour-shops,* at S
pence a-piece.

To keep Ink from Freezing or Moulding.

hard Frosty Weather, Ink *will* be apt to freeze ;
hich if once it doth, it *will* be good for nothing ; for
es away all its Blackness and Beauty. To prevent
h (if you have not the Conveniency of keeping it warm
m the Cold) put a few Drops of Brandy, or other Spi-
into it, and it will not freeze. And to hinder its
ding, put a little Salt therein.

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miliar Letters on several Occasions, and on divers
Subjects.

EFORE we enter upon *Arithmetick*, it may be pro-
per to give some Examples of Letters on various Sub-
and upon divers Occasions ; which Letters frequently
over, and sometimes copied, it may be a good Intro-
on to a handsome Style of Sense, and to a commenda-
Manner of Writing ; besides the Help and Use they
be of in noting and observing the Method of Spelling
English, and Orthographically placing *Great Letters*,
pitals, where they ought to be ; and also an imprinting
e Mind the due Notion of Points, Stops, *&c.* and when
where to be made.
tters are variously worded, and ought properly to
ss the Desires, Thoughts, *&c.* of the Writer to the
er, that thereby the Receiver of the Letter may *fully* un-
nd, and be justly inform'd of the Occasions, Wants, or
tions of the Sender.
tters being writ on divers Subjects, and on sundry Oc-
ns, they may be ranked under these Denominations, or
al Heads following, *viz. Letters of proffered Assistance,*
rs Consolatory, Letters of Thanks, Letters Congratulatory,
of Reproof, Ditto of Excuse, Ditto Accusatory, Ditto of
ice or Counsel, Ditto of Recommendation, Ditto Exhorta-
Ditto of Remonstrance, and Letters of Visit, properly cal-
amiliar Letters, Letters of Business ; and lastly, *Mixed*
rs, that is, on various Subjects, and different Affairs.
hall not have Room to touch upon every one of these
cularly ; but I shall give sundry Examples promiscuously
ited, and are such as these that follow, *viz.*

A

A Letter from a Son to his Father.

London, 6th Dec. 17

Honoured Father,

WITH all Dutiful Respect, I trouble you with th
Lines, to enquire of the good State of your Hea
(of which I shall be extremely glad to hear) and to pref
you my most humble Duty, and Tenders of filial, and m
affectionate Service. I have not had the Favour of
Letter from you since that from you dated the 8th of O
ber last, which I reply'd to the very next Post, and in f
Particulars as you enjoined me. I have sent you, Sir,
Samuel Simple, the *Pemsey* Carrier, a Spaniel Dog, wh
is an excellent good one of his Kind, and fit for the Spor
your Place ; his Name is *Tray*, and is very free for the W
ter ; and if he hath any Fault, it is being a little too eag
but he is young, and may be brought to what you'd ple
to have him. I hope my Sister *Mary* is well, to whom p
give my kind Love, and also be pleased to accept of my D
ty to your self, which is the Present needful from,

Sir, your most dutiful Son,
and humble Servant,

Anthony Addleh

The Answer.

Pemsey, 28 Xber. 17

Dear Toney,

I Received your Letter of the 6th Instant, and I take
tice of your dutiful Respect and kind Wishes for
Health, which, I thank God, I perfectly enjoy at pref
as I wish and hope you do yours.—I received your Pref
of the Dog ; but the poor Cur was almost starv'd, hav
(as I suppose) had nothing on the Road ; but he is now
good Condition, and hath been try'd as to his Mettle,
find he is a good one. I have sent you by the Carrier
a dozen wild Ducks, which *Tray* fetch'd when I had sh
them. Your Sister *Molly* remembers her kind Love to yo
and hath sent you a Turkey, and a Chine of Bacon,
which I wish you (and your Friends, if you invite any)

Stomach. With my Blessing and Prayers to God for concludes your tender and very

Loving Father,

Andrew Addlehill.

P. S. We have a great many Fowl in our *Level,* so that may expect another Present that kind in a little Time.

Note, That these four short Lines are called the Postscript, because they are writ after, when the Body of the Letter is done.

A Letter from a Young Man to his Uncle.

Honoured Uncle,   *Norwich, Dec.* 7, 1739.

SIR,

THE many kind and courteous Things that you have done for me, oblig'd me, in Point of Gratitude, as well as Duty, to return you my most humble Thanks, and to offer you my poor, but real and hearty Service, in the Affair between you and Mr. *A B.* of this Place: And if you will please but to communicate to me your Intentions, and give me your Directions therein, I shall observe and *follow* them with all Punctuality; and will from Time to Time give an exact Account of my Negociations in that Affair. Now expecting to receive your Commands by the first convenient Opportunity, I rest and remain,

Sir, your most obliged Nephew,

and very humble Servant,

Brian Bing.

The Uncle's Answer.

London, 12 *Dec.* 1739.

Nephew,

I Take your Offer of Service to me in the Business between me and Mr. *A. B.* of your City very kindly, and think none fitter to adjust that Affair than yourself; but I am unwilling to go to Law, and had rather, much rather, that you would endeavour to bring him to some reasonable Accommodation; for in such Contests the Winner is a Loser in the Upshot. So if I can bring him to any reasonable Terms, I *shall* be very glad: You understand the Affair,

and

and so I *shall* commit it *wholly* to your difcreet and go
Management, being perfuaded that you'll do for me as
yourfelf: So I remain your Loving,

<div align="right">

And Affectionate Uncle,

Bazil Bin

</div>

A Letter from a Neice to her Aunt.

<div align="right">

London, 7*th Dec.* 175

</div>

Madam,

THE Trouble I have already given you, puts me
the Blufh, when I think of intruding again on yo
Goodnefs ; but Neceffity, that frequently puts us upon wh
we have not always a Mind to, and forces us againft o
Inclinations, which is now the Motive that induces me
be thus troublefome. Pray, dear Madam, excufe me, if
once more beg your Affiftance in this Time of my uniu
Misfortune, and I fhall ever have a grateful Remembra
of your Goodnefs to me ; and I hope I *shall* be one Ti
or other in a Capacity of making fome Returns of the ma
Obligations your Goodnefs hath conferred upon me ye
moft refpectful Neice,

<div align="right">

And humble Servant,

Penelope Pinc

</div>

A Letter of proffer'd Affiftance to a Friend.

Dear Friend,

I Should be falfe to true Friendfhip, if I fhould neglect
caft off my Friend in Adverfity ; I hearing that you
under fome Misfortune, and, at prefent fomewhat pinc
with Want, I fend you thefe Lines for your Confolati
defiring you to bear up againft your ill Luck with as mu
Prefence of Mind as you can ; for affure yourfelf, I fh
fuddenly follow this Epiftle in Perfon, and come, I hop
opportunely enough to your Affiftance ; 'till which Ti
take Courage, and be affured that you fhall not be
apppointed of timely Help from, dear Friend,

<div align="right">

Yours, in reality,

Timothy Timel

</div>

A Brother to a Sister.

Dear Sister,

THE great Distance and long Absence of me from you (tho' I have not wanted good Company) makes me very solicitous concerning your Welfare; Natural Affection inclines me strongly to have you in Remembrance, rendering your Health and Welfare in every respect as dear as my own; and there is nothing at my Command, but, if you request, it shall be freely yours. Notwithstanding the Distance, I purpose (God willing) to make you a Visit very shortly, and had done it before now, but an urgent Occasion interpos'd, the Particulars of which being too long for a Letter, I shall acquaint you of when I see you: Pray give my due Respects to all Friends, particularly to honest Mr. *S. T.* and so in a hopeful Expectation of finding you well at my Arrival, I conclude, and remain,

<div align="right">

Dear Sister,

Your affectionate Brother,

and humble Servant,

Henry Hearty.

</div>

A Letter from a Youth at School, to his Parents.

<div align="right">

London, 6th *Dec.* 1739.

</div>

Honoured Father and Mother,

I Received your kind Letter of the 4th of *November* past, and also the several Things therein mentioned, by the *Coichester* Carrier, for which I return you my most humble and hearty Thanks, they coming very seasonably to the Relief of my Occasions.—I begin to make pretty good Improvement in my Learning now (tho' at the first it seem'd like irksome and hard) and I hope to gain the Point at last, for which you sent me hither. Pray, dear Parents, accept of my most humble Duty to your selves, and kind Love pray remember to my Brothers and Sisters, and to my quondam *Play-fellows, particularly* to *Jackey Jingle-brains,* and *tell* him I hope by this Time he begins to be a little serious.—This being *all* at present from,

<div align="right">

Honoured Parents,

Your dutiful Son, and humble Servant,

Stephen Studious.

</div>

<div align="center">D</div>

<div align="right">*From*</div>

From an Apprentice to his Friends.

Honoured Father and Mother,

BY thefe I let you know, that by your good Care and Conduct I am *well* fettled, and am very *well* pleafed with my Station, and could not but in Duty return you my hearty Thanks in a grateful Acknowledgement of your Love and tender Care of me ; I *will* endeavour to go thro' my Bufinefs *chearfully* ; and having begun *well,* I hope I *fhall* perfevere fo to do to the End, and that I may be a Comfort to you hereafter, and in fome Meafure make a Return of your Love and Kindnefs to me, who am

Your moft dutiful and obedient,

Son and Servant,

Daniel Diligent

A Letter of Recommendation.

S I R,

THE Bearer hereof, *Francis Faithful* I fend to you as one whofe Honefty you may rely on, and my Experience of his Conduct and Fidelity gives me a certain kind of Confidence in recommending him to you ? but you know me, Sir, and I believe you cannot in the leaft think that I would recommend any one to you, that I had the leaft Umbrage of Sufpicion or Doubt concerning their Probity. I am with due Refpects,

Sir, your real Friend,

and humble Servant,

George Generous

A Daughter to a Mother, in relation to Marriage.

Honoured Mother,

WITH all Duty, Humility and Refpect, I addrefs my felf to you in thefe Lines, hoping they will find you in perfect Health both of Body and Mind, for which I am never wanting in my Prayer to implore. As I would act nothing that is very material, without your Knowledge, Confent, and Approbation, I thought it my Duty to acquaint you of a Matter of the greateft Weight and Importance, pardon me if I blufh to name it, *viz.* that of my Marriage ; the Perfon (as I think) is well deferving of my

r one much better ; it is Mr. *A. B.* of *C.* You know
oth him and his Character, *viz.* one fober, diligent, and
ood humoured ; but however I fhall fubmit to your good
leafure and Guidance in an Affair of fuch momentous Con-
ern, and remain,

> *Honoured Mother,*
> *Your dutiful Daughter,*
> *and very humble Servant,*
> Mary Modefty.

To a Country Chapman.

Mr. Francis Fairdealer,   *London, 8th Dec.* 1739.
  S I R,

YOU and I have formerly had Trading together, and
it is not my Fault that we do not continue fo to do ;
or affure your felf, I have a great Value and Refpect for
ou, and on that Account none fhall be more ready to ob-
ige you in what I may ; and pray let us once more re-af-
me our Dealings together ; and you fhall find, that for
ny Goods you have occafion for in my Way, none *fhall*
fe you more kindly than,

> *Sir,*
> *Your real Friend, and humble Servant,*
> Titus Tradewell.

A Letter of Congratulation.

  S I R,

IF you were but fenfible how fenfibly I am affected with
the good and moft acceptable News that I hear of your
ood Fortune, you would conclude that the Joy that fur-
rizes me for the fame, is equal to yours that enjoy fo hap-
y a Turn of Providence : I could exprefs my elf further
n this Theme, and enlarge exceedingly on fo pleafing a
ubject ; but let this at prefent fuffice, *till* I have a more
vourable Opportunity of expreffing my Joy to you per-
nally ; in the Interim I am truly,

> *Sir,*
> *Your fincere Friend,*
> *and very humble Servant,*
> Ralph Real.

       A

A Letter of Enquiry of Health.

Hammerſmith, 9th Octob. 1739.

S I R,

I Not hearing from you in ſuch a length of Time as from the 12*th* of *June* laſt to this Time, I am therefore un-der a great Concern for you, leſt ſome Misfortune of Sick-neſs, or ſome other Accident, hath happened to you, or to ſome one of your Family ; my Uneaſineſs thereon, oc-caſions my giving you the Trouble of theſe Lines, which I wiſh may find Things with you better than my Fears ſug-geſt ; however, to put me out of Pain, be pleas'd to let me know the Certainty with what convenient Speed you can; and thereby you'll very much oblige, *Sir,*

> *Your cordial and real Friend,*
> *and very humble Servant,*
> Peter Pitiful.

A Letter by way of Petition to a Friend.

Honoured Sir,

I Am uncertain whether my late Misfortunes have come to your Knowledge ; however I moſt humbly preſume on your good Nature, being aſſured by ſundry Examples of your Compaſſion, that you *will* think of, and take Pity on the Diſtreſſed ; therefore, as an object truly deſerving Compaſſion, I moſt humbly implore, and petition you to conſider the many Loſſes and Diſappointments that I have met with in my unlucky and wayward Fortune, which have reduced me to ſuch neceſſitous Circumſtances, that I cannot poſſibly proceed in my Affairs : You was pleaſed once to ſtile me your Friend, and ſo I was indeed ; and ſo I would moſt certainly be now, and ſhew it by a ſignal Proof of Kindneſs, if our Circumſtances were changed, by ſtanding between you and Misfortune, and ſcreening you from the malevolent and inauſpicious Influences of croſs-grain'd Stars. I doubt not, Sir, but your Generoſity and Goodneſs is as great ; and, I hope, with all Humility you will be pleaſed to interpoſe your good Offices, &c. between unlucky Fortune and,

> *Sir,*
> *your very humble Servant,*
> Lawrence Luckleſs.

A Letter of Friendship.

Dear Friend,

IT is now a long Time (as I account it) since you and I have had any mutual Converse by Letter, which to me is a great Unhappiness ; and really, if Distance did not somewhat excuse, I should be apt to tax you with Unkindness ; but however, perhaps you may not have the same Conveniency of Writing at your Place for want of Postage) as we have at ours, and on that account, I shall not insist on your Infringement of Friendship, but the chief Purport of these is to enquire of your Welfare, and to have an Answer given to, *Sir,*

> *your real Friend,*
> *and very humble Servant,*
> Kendrick Kindly.

A Letter of Correspondence.

Sir,

YOURS of the 5th *ult.* is now before me ; in answer to which, I positively declare, That Mr *A. B.* hath not been with me to present the Bill of Exchange that you mention in your Letter of Advice to me, and therefore there can be no just Cause of Protest, or any other Charge, put on, *Sir,* *Your humble Servant,*

> John Innocent.

It is as proper to know how to Subscribe, and how to Direct, as it is to write a Letter.

SUPERSCRIPTIONS.

To his most Excellent Majesty ; or, *To his most Sacred Majesty,* &c. *To the Queen's most Excellent Majesty,* &c.
To the Prince, *To his Royal Highness,* &c.
To the Princess, *To her Royal Highness,* &c.

To Spiritual Lords,

To his Grace the Lord Arch-bishop of Canterbury ; or *To the most Reverend Father in God,* &c.

To other Bishops,

To the Right Reverend Father in God, &c.

To the Inferior Clergy,

To the Reverend Mr. A. &c. or, *To the Reverend Doctor,* &c.

To Temporal Lords,

To his Grace the Duke of, &c. *To the Right Honourable the Marquis of Hallifax. To the Right Honourable the Earl*

D 3 *of*

of Suſſex.   *To the Right Honourable the Lord Viſcount Aſh-burnham.*

The Sons of Nobility,

Muſt be dignified (tho' not immediate Heirs) with the Title of *Honourable*, as being their Due by Birth.

To a Baronet, *Honourable*, by Virtue of his Patent, or *Right Worſhipful*; and alſo to a Knight, *Right Worſhipful*. To an Eſquire, *Worſhipful*.—Every Privy-Counſellor, tho' not a Nobleman, hath the Title of *Right Honourable*. All Embaſſadors have the Stile of *Excellency*; as hath alſo the Lord Leiutenant of *Ireland,* and the Captain-General of his Majeſty's Forces. The Lord Mayor of *London*, during his Mayoralty, hath the Title of *Right Honourable*. And the Sheriffs, during that Office, have the Title of *Right Worſhipful*. All Mayors of Corporations have the Title of *Eſquires*, during their Office.

For the Beginning of Letters.

To the King; *Sir,* or, *May it pleaſe your Majeſty.*
To the Queen; *Madam,* or *May it pleaſe your Majeſty.*
To the Prince; *Sir,* or *May it pleaſe your Royal Highneſs.*
To the Princeſs; *Madam,* or *May it pleaſe your Royal Highneſs.*
To a Duke; *My Lord,* or *May it pleaſe your Grace.*
To a Dutcheſs; *Madam,* or *May it pleaſe your Grace.*
To a Marquiſs; *My Lord,* or *May it pleaſe your Lordſhip.*
To a Marchioneſs; *Madam,* or *May it pleaſe your Ladyſhip.*
To an Earl, Viſcount, or Baron; *Right Honourable,* or *May it pleaſe your Lordſhip.*
To their Conſorts; *Madam,* or *May it pleaſe your Ladyſhip.*
To a Knight; *Sir,* or *Right Worſhipful.*
To his Lady; *Madam,* or *May it pleaſe your Ladyſhip.*
To a Mayor, Juſtice of the Peace, Eſquires, &c. *Sir,* or *May it pleaſe your Worſhip.*

At Subſcribing your Name, conclude with the ſame Title you began with; as *My Lord, Your Lordſhip,* &c.

Of Secret Writing.

HERE it may not be improper to ſay ſomething of Secret Writing; to which Biſhop *Wilkins,* in his Book of *Mathematical Magick,* ſpeaks largely; but it is principally concerning Writing in Cypher, which requires great Pains, and an uncommon ſhare of Ingenuity, both

Writers and Readers. But however I shall shew two or three particular Ways, that are very pretty and amusing, and also very easy, both as to Cost and Painst And,

First, If you dip your Pen in the Juice of a Lemon, or of an Onion, or in your own Urine, or in Spirits of Vitriol, and write on clean Paper whatever you intend, it *shall* not be discerned *till* you hold it to the Fire, and then it will appear legible. And if with any of the aforementioned, you write on your Skin, as on your Arm, and Back of your Hand, *&c.* it shall not be seen *till* you burn a Peice of Paper, and with the Ashes rub on the Place, and then it *will* appear very plain : And this I have experienced and try'd, and therefore can say, *Probatum est.*

Another Way is, When you write a Letter that you intend it shall not be discovered, but to those you think fit ; is first to write your Thoughts on one Side of your Letter with black Ink, as usual, (but it ought to be on thin Paper) and then on the contrary Side, go over the said Matter that you would have secret, with a clean Pen dip'd in Milk ; and that Writing *shall* not be read without holding it to the Fire, as mentioned above, and then it *will* appear *legible* in a bluish Colour.

A third Method, is to have two Pieces of Paper of equal Size, and the Uppermost cut in checquered Holes or Squares big enough to contain any Word of six or seven Syllables, and in those Squares write your Mind in regular Sense ; and then take off the said checquered Paper, and fill up the Vacancies with Words of any Kind, which will render it perfect Nonsense, and not capable of being read, to any Purpose of Intelligence. And transmit and send the said uppermost, or checquered Paper, or another exactly of the same Form, to your Correspondent ; whereby he shall, by laying it nicely on your said Letter, read your intended Sense, without being perplexed with the Words of Amusement intermixed, which makes it altogether unintelligible.

Or, again, you may write to your Friend in proper Sense with common Ink, and let the Lines be at so commodious a Distance, that what you intend to be Secret may be written between them with Water, wherein Galls have been steeped a little Time ; (but not long enough to tincture the Water) and when dry nothing of the Writing between the said Lines can be seen ; but when it is to be read, you must with a fine Hair Pencil dip'd in Copperas Water, go between

the

the said Lines, and so you make it legible. *Note,* This Way will give no Ground for Suspicion, because the Letter seemeth to carry a necessary Sense in those Lines that are set at such a proper Distance, &c.

Of ARITHMETICK.

AFTER Writing, the next necessary Step towards qualifying a Person for Business, is the Understanding that truly laudable and most excellent Accomplishment, the noble Science of *Arithmetick* ; a Knowledge so necessary in all the Parts of Life and Business, that scarce any thing is done without it.

In my Directions for its Attainment, I shall proceed with such Plainness of Method, and Familiarity of Stile, as shall render it easy to be understood, and conspicuous to the meanest Capacity.

And first of *Notation* and *Numeration.*

In *Notation,* we must note or observe that all Numbers are expressed by, or composed of, these ten Figures or Characters following, *viz.*

One, Two, Three, Four, Five, Six, Seven, Eight, Nine, Cypher.
1   2   3   4   5   6   7   8   9   0

Nine of these are call significant Figures, to distinguish them from the *Cypher,* which of it self signifies nothing ; but as it is placed (in whole Numbers) serves to increase the Value of the next Figure or Figures that stand before it ; as 3 is but Three ; but before the *Cypher* thus, 30, the 3 becomes Thirty, *&c.*   But in Decimal Fractions, the (0) decreases the Value of the Figure behind it ; for therein, 3 is three Tenths of any thing ; but by placing 0, before it, thus, 03, it is decreased from 3 tenth Parts, to 3 hundredth Parts of any thing, *&c.* ——We are to note, That every one, or any, of the above mentioned nine Figures, or Digits, have two Values ; one certain, and another uncertain ; the certain Value is, when it stands alone by itself ; the uncertain is, when joined or placed with other Figures or Cyphers ; for when any one of these Figures stands alone, they signify no more than their own simple Value ; as 5 is but Five, 4 but Four, 6 but Six, and 3 no more than Three, *&c.* And this is the certain Value of a Figure : But when another Figure or Cypher is annexed, they then are increased in their
Value

Value ten Times; as 5, or 5 Units, or Ones, to 5 Tens or Fifty, 4 to 4 Tens or Forty, 6 to 6 Tens or Sixty, and 3 to 3 Tens or Thirty; as thus, 51, Fifty-one; 42, Forty-two; 63, Sixty-three; 34, Thirty-four, &c. Again, if any of the said Figures ftand in the third Place towards the Left-hand, they fignify fo many Hundreds as they expref-fed Units or Ones; as 500 is Five hundred, 400 Four hundreds, 600 Six hundreds, and 300 Three hundreds, &c. If any of them poffefs the 4th Place towards the Left-hand, they are fo many Thoufands as they contain Units: And fo any, or every Figure, increafes by a Ten-fold Proportion, from the Right-hand to the Left, according to the Place it is found or ftands in; fo that 5 may be but Five, or Fifty; Five hundred, or Five thoufand: In the firft Place, 5; in the fecond, 50; in the third, 500; in the fourth Place, 5000, &c. And therefore, this is the uncertain Value of a Figure: But the true Value of Figures in Conjunction, may be fully learnt and underftood by the following Table.

The Numeration Table.

12 C Thouf. of M.	11 X Thouf. of M.	10 Thouf. of Mil.	9 C of Millions.	8 Tens of Mill.	7 Millions.	6 C of Thouf.	5 Tens of Thouf.	4 Thoufands	3 Hundreds	2 Tens	1 Units	Hund. Thouf. of Mil.	Hundreds of Mill.	Hundreds of Thouf.	Units or Ones
1	2	3	4	5	6	7	8	9	0	1	2	123	456	789	012
	1	2	3	4	5	6	7	8	9	0	1	12	345	678	901
		1	2	3	4	5	6	7	8	9	0	1	234	567	890
			1	2	3	4	5	6	7	8	9		123	456	789
				1	2	3	4	5	6	7	8		12	345	678
					1	2	3	4	5	6	7		1	234	567
						1	2	3	4	5	6			123	456
							1	2	3	4	5			12	345
								1	2	3	4			1	234
									1	2	3				123
										1	2				12
											1				1

For the eafier Reading of any Number, firft get the Words at the Head of the Table by Heart; as Units, Tens, Hundreds,

D 5

dreds, Thousands, &c. and apply'd thus, 75, five Units, Five, and 7 Tens, Seventy, that is, Seventy-five. Again, 678; 8 Units, Eight, 7 Tens, Seventy; and 6 Hundreds, six hundred; that is, Six hundred seventy eight. Once more, 3456; 6 Units, six; 5 Tens, fifty; 4 Hundreds, four Hundred; 3 Thousands, three Thousand; together, Three thousand four hundred fifty-six. Read the 4th Line of the Table downwards, *viz.* 123456789; here the Valuation of the Figures is from the Right-hand to the Left, as 1 in the ninth Place is Hundreds of Millions; but to be read from the Left-hand to the Right; thus, One hundred twenty-three Millions, four hundred and fifty-six thousand, seven hundred eighty-nine. But any Number may yet be read more intelligibly, *viz.* by Stops, thus: make a Comma after every third Figure or Cypher, beginning at the Right-hand, and so on towards the Left, making a Stop after every third Figure or Cypher, as abovesaid; thereby distinguishing every third Place into Hundreds, as Hundreds of Units, Hundreds of Thousands, Hundreds of Millions, and Hundred Thousands of Millions, &c. And for Trial let's read the first Line of the Table; the last Place in Valuation is Hundred Thousands of Millions, and to be pointed into Periods thus, 123,456,789,012; and read thus, One hundred twenty-three thousand, four hundred fifty-six Millions, seven hundred eighty-nine thousand, and twelve; that is, no hundreds, but twelve. Again, read the following Number, *viz.* 276,245,678,921,460; here the first Point or Period is between 4 and 1, and the last between 6 and 6, and to be read thus; 276 Millions of Millions, 245 Thousands of Millions, 678 Millions, 921 Thousands, 460 Units, or Ones. And thus may any Number be read with ease, though a large one: And thus are large Numbers or Sums expressed, or set out in the Exchequer, Bank, Lottery Tickets, &c. as thus, N⁰ 224, 156, — 19, 478, — and 420,000, &c. The foregoing *Table of Numeration* is on the Right-hand distanced out into Periods, for the easier reading thereof.

Numbers to be read or written, *viz.*

96, *Ninety-six.*

242, *Two hundred forty-two.*

7924, *Seven thousand 9 hundred 24.*

54006, *Fifty-four thousand and six.*

524707, *Five hundred 24 thousand 707.*

4706240, *Four millions 706 thousand 240.*

62700472, *Sixty-two millions 700 thousand 472.*

474960204, *Four hundred 74 millions 960 thousand 204.*

4214007042, *Four thousand 2 4 millions 7 thousand 42.*

44214800240, *Forty-four thousand 214 millions 8 hundred thousand 240.*

Of Numerical Letters.

Sometimes Numbers are expreſſed by Letters ; and it is neceſſary to underſtand them, for the readier reading the dates of Years, frequently uſed at the Foot of Title Pages of Books, and on Funeral Monuments, and in Roman Hiſtory, *&c.*

I *ſignifies One.*

V *Five.*

X *Ten.*

L *Fifty.*

C *An Hundred.*

CC *Two Hundred.*

D *or* IƆ *Five Hundred.*

M *or* CIƆ *A Thousand.*

IƆƆ *Five Thousand.*

CCIƆƆ *Ten Thousand.*

IƆƆƆ *Fifty Thousand.*

CCCIƆƆƆ *An Hundred Thousand.*

IƆƆƆƆ *Five Hundred Thousand.*

CCCCCIƆƆƆƆ *Ten Hundred Thousand, or a Million.*

M.DCC.XLII. *expreſſes this preſent Date of 1742. M being One Thousand, D Five Hundred, CC Two Hundred, and XLII Forty two ; together One Thousand Seven Hundred and Forty-two.*

ADDITION,

IS the putting together two or more Numbers or Sums, ſo as their total Value may be diſcovered or known.

Herein we muſt always obſerve to ſet the Numbers to be added, orderly one under the other ; that is, Units under Units, Tens under Tens, Hundreds under Hundreds, *&c.* in the ſubſequent Examples.

Addition

Addition of Numbers of one Denomination.

Yards.	Galluns.	Pounds.
T.U.	H.T.U.	X of Th.Th.H.T.U.
2 4	7 5 6	5 7 9 6 2
4 2	4 3 2	3 9 7 4 4
6 8	5 7 8	6 7 2 2 2
8 6	6 9 6	7 9 6 7 4
2 4	4 2 2	2 4 9 2
4 2	6 7 8	3 9 0
2 8 6	3 5 6 2	2 4 7 4 8 4

In Addition of fimple Numbers, whether it be *Yards,* *Gallons,* *Pounds,* or any thing elfe, remember to carry 1 for every 10 that you find in the firft Row or Rank of Figures, being Units, to the next Row of Tens ; and the like from the Rank of Tens to the Row of Hundreds, &c. and what ever it makes in the laft, you muft fet it down, amount to what it will.

The Numbers above are fet down in order, as before di-rected ; that is, Units under Units, Tens under Tens, &c. as may be plainly underftood, by being indicated at the Head of each Row, or Rank with Units, Tens, Hundreds, &c. Then in cafting up each Example, to know its Total, I begin at the Right hand, or Unit's Rank, of the firft Ex-ample, and fay, 2 and 4 is 6, and 6 is 12, and 8 is 20, and 2 is 22, and 4 is 26 ; in which Row there are two Tens and 6 over ; wherefore I fet down 6 juft under its own Rank, and carry 2 to the next or laft Row, and fay, 2 that I carry and 4 make 6, and 2 is 8, and 8 is 16, and 6 is 22, and 4 is 26, and 2 is 28 ; and it being the laft Row, I fet down the Amount, *viz.* 28 ; fo that the Total Number of Yards is found to be (by this Method) at the Bottom 286. And the next or fecond Example, is found by the fame Method to be 3562 Gallons. And in the third and laft Example, the Total Number of Pounds is found by the fame Way to be 247484. And fo the Total of any other Example of the fame kind, *viz.* fimple Numbers of one Denomination, may be found. *Note,* That when any of the Ranks amount to juft 10, 20, 30, 40, 50, &c. then you muft fet down the 0, under its proper Rank, and carry either

ither 1, 2, 3, 4, or 5, according to the Number of Tens
hat you find, to the next Row; and so you must always do,
when it so happens, whether in the first, second, or third
Row; or in any other, except the last, where what it
mounts to must be set down, without any Reserve or Car-
riage in the Mind, because there is no other Row or Rank
to carry to, as was hinted before.

And so much for *Addition of Numbers of one Denomination,*
which never varies from what has been said above; serving
strictly to keep to the critical, and nicely setting down in
perpendicular Order your several Numbers, that Units may
precisely and directly stand under Units, Tens under Tens,
&c. as hath fully been declared before. The next in Or-
der, of course, is *Addition of Numbers of several Denomina-
tions*; or *Addition of Money*.

As we in *England*, or *Great Britain*, keep our Accounts in
Pounds, Shillings, and Pence, and Parts of a Penny; so you
are to note, that

<div align="center">

4 *Farthings make* 1 *Penny,*
12 *Pence* 1 *Shilling,* and
20 *Shillings* 1 *Pound*.

</div>

And here also you are strictly to observe, and with the
same Punctuality to mind, that Pounds be set directly under
Pounds, Shillings under Shillings, Pence under Pence, and
Farthings under Farthings; as in the Examples hereafter
following.

But before you proceed, it will be necessary to have the
following Tables by Heart, for the readier Knowledge how
many Shillings there are in so many Pence, and apprehend-
ing how many Pounds are contained in so many Shillings, &c.

Pence.	s.	d.		s.	l.	s.
20 is	1	8		30 is	1	10
30 —	2	6		40 —	2	0
40 —	3	4		50 —	2	10
50 —	4	2		60 —	3	0
60 —	5	0		70 —	3	10
70 —	5	10		80 —	4	0
80 —	6	8		90 —	4	10
90 —	7	6		100 —	5	0
100 —	8	4		110 —	5	10
110 —	9	2		120 —	6	0
120 —	10	0				

The

The Ufe of thefe Tables is this; when ever you are caft-
ing up any Example, or Sum of Money, you begin at the
Right-hand (as before in Sums of one Denomination) the
Place of Pence, and fuppofe the Rank, Row, or Denomi-
nation of Pence amounts, from the Bottom to the Top, to
56; then your Table of Pence tells you that 50 *d.* is 4 *s.*
and 2 *d.* 6 over is 4 *s.* 8 *d.* If to 92 *d.* the Table tells you
that 90 *d.* is 7 *s.* 6 *d.* and 2 *d.* over, is 7 *s.* 8 *d.* And if to
81 *d.* the Table fhews that 80 *d.* is 6 *s.* 8 *d.* and 1 *d.* more
makes 6 *s.* 9 *d.* &c.

The *Shillings Table* ferves to lead you to a quick Recol-
lection how many Pounds there are in fo many Shillings;
as admit the Rank of Shillings arifes to 57 *s.* the Table
fays that 50 *s.* is 2 *l.* 10 *s.* and 7 *s.* over makes 2 *l.* 17 *s.*
If to 84 *s.* the Table declares that 80 *s.* is juft 4 *l.* and 4 *s.*
over makes 4 *l.* 4 *s.* If fo 112 *s.* the Table tells you that
100 *s.* is 5 *l.* and 12 *s.* more make 5 *l.* 12 *s.* &c.

Addition of Money.

Money Owing, and Money Received, as follows,

		(1)					(2)		
		l.	*s.*	*d.*			*l.*	*s.*	*d.*
	Mr. *Andrews*	4	12	6		Tabacco	46	10	9
	Mr. *Bent*	7	06	9		Sugar	79	16	0
	Mr. *Crawley*	4	12	0		Indigo	42	18	3
Ow.	Mr. *Dupper*	6	17	7	Rec.	Broad Cloth	66	12	4
to	Mr. *Edlin*	5	06	6	for	Canary	90	16	0
	Mr. *Franklin*	4	12	3		Port-Wine	84	07	6
	Mr. *Gregory*	6	00	0		Rice	24	12	0
	Mr. *Fifher*	5	15	4		Logwood	60	10	2
		45	02	11			496 : 3 : 0	496 02 10

Note, That *l.* ftands for Pounds, *s.* for Shillings, *d.* for
Pence, and *qr.* for Farthings; in regard that *Libra* fignifies
a Pound, *Solidus* a Shilling, *Denarius* a Penny, and *Qua-
drans* a Farthing.

I begin with the firft Example of Money-Owing, and fay,
4 and 3 is 7, and 6 is 13, and 7 is 20, and 9 is 29, and
6 makes 35 Pence; now 30 Pence, according to the Table
is 2 *s.* 6 *d.* and 5 *d.* makes 2 *s.* and 11 *d.* I fet down
11 exactly under the Rank of Pence, and fay, 2 Shillings
that I carry (which I do to the Rank of Shillings) and 5 is

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ings;
Table
17 s.
4 s.
that

7, and 2 is 9, (for I only take the Units Rank of Shillings) and 6 is 15, and 7 makes 22, and 2 is 24, and 6 is 30, and 2 makes 32; and now being come to the Top of the Sum, and it making 32, I come down with the Tens of Shillings, ſaying 32 and 10 is 42, and 10 is 52, and 10 is 62, and 10 is 72, and 10 makes 82 Shillings; and the Table telling me that 80 Shillings is 4 Pounds, I know therefore 82 s. is 4 l. 2 s. wherefore I ſet down the odd 2 s. juſt under the Row of Shillings, and carry 4 Pounds to the Pounds; ſaying, 4 that I carry and 5 is 9, and 6 is 15, and 4 is 19, and 5 is 24, and 6 is 30, and 4 is 34, and 7 is 41, and 4 makes 45 Pounds; ſo that the Total of thoſe ſeveral Sums of Money, due to thoſe ſeveral Perſons, amounts to 45 l. 2 s. 11 d. as in the Example.

In the ſecond Example of Money received, I begin at the Right-hand (as in all *Additions, Subtractions,* and *Multiplications,* we do, and ought ſo to do, working from the Right-hand to the Left; but in *Diviſion* you begin the Operation at the Left, and work towards the Right,) and ſay, 6 and 4 is 10, and 3 is 13, and 9 makes 22; and 22 Pence being 1 s. 10 d. I ſet down 10, and carry 1 s. to the Shillings; ſaying 1 that I carry, and 2 is 3, and 7 is 10, and 6 is 16, and 2 is 18, and 8 is 26, and 6 makes 32; then I come down with the Tens, ſaying, 32 and 10 make 42, &c. and find at the Bottom is comes to 102 Shillings; which making 5 l. 2 s. I ſet down 2 s. and carry 5 l. to the Pounds; ſaying, 5 that I carry, and 4 is 9, &c. I find that at the Top it amounts to 36, wherefore I ſet down 6 exactly under its own Rank, *viz.* the Rank of Units of Pounds, and carry 3 for the 3 Tens that are in 30, for at all Times in the firſt Denomination of Addition, whether of Money, Weight, or Meaſure; that is in the Denominations of Pounds, Tuns, or Yards, you muſt caſt them up as Sums of one Denomination; that is for every Ten carry One to the next, &c. ſaying, 3 that I carry, and 6 is 9 and 2 is 11, and 8 is 19, &c. and find that at the Top it comes to 49; wherefore I ſet down 49 before the 6; and the Total Amount of the Money received for thoſe particular Goods or Wares ſold, is 496 l. 2 s. 10 d.

d.
0   9
6   0
8   3
2   4
6   0
7   6
2   0
0   2

———
2   10
———

d. for
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Qua-

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illings
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7,

The loweſt Figure in the Pence [2], with which you ought to begin, is here omitted;

More

More Examples for Practice.

		l.	*s.*	*d.*		10	20	12	4		*l.*	*s.*	*d.*
	Mr. *Money*	17	12	6¼	*l.*	146	12	3	½		4	10	6
	Mr. *Gaunt*	26	10	2		278	10	9			0	07	9
	Mr. *Hern*	50	00	0		46	16	6			1	00	0
	Mr. *James*	44	12	8½		100	00	0			1	01	0
	Mr. *King*	60	14	0		72	12	4			0	04	6
	Mr. *Long*	29	16	6¾		69	16	6	¾		0	10	0
	Mr. *Monk*	16	10	0		460	12	6			4	14	4
	Mr. *Napper*	20	00	0		49	10	0			0	07	6
	Mr. *Oliver*	27	11	4½		7	12	4	½		0	01	6
	Mr. *Perkins*	17	04	0		22	10	0			0	02	6
	Mr. *Quinton*	20	10	3		164	12	9			3	10	9
	Mr. *Roper*	46	16	8		75	10	6			1	10	0

Total 377 18 3 ———— 1494 16 6¾ ———— 18 00 4

Over the middle Example there are Numbers set, to de-
note what you must stop at, if you cannot cast it up without.

Addition of Avoirdupois Weight.

By this Weight are weighed all Kinds of *Grocery* Goods
or Wares, or Goods subject to waste; as *Tobacco, Sugars,
Fruit* and *Drugs,* as also *Butter, Cheese, Allom, Tallow,
Flesh, Iron, Brass, Copper, Lead, Tin,* or *Pewter, Pitch, Tar,
Rosin, Hemp, Flax, Soap, Salt,* and all kind of *Garbled
Goods;* that is those Goods that have Dust, Dross, or
Waste.

A Table of this Weight is as follows, *viz.*

Marked.

4 Quarters *make* 1 Dram   *dr.* Drams
16 Drams 1 Ounce   *oz.* Ounce
16 Ounces 1 Pound   *lb.* Pounds
28 Pound 1 qr. of a hundred
    Weight, or 112 *lb.*   *qrs* Quarters
4 Quarters 1 Hundred Wt.   *C.* Hundreds
20 Hundred Wt. 1 ~~Tun~~   *T.* ~~Tuns~~
                 Ton   *Tons.*

Small Weight.

28	10	4	28	28	10	16	16
C. qrs.	lb.	C.	qrs. lb.	C. qrs.	lb.	lb. oz.	dr.
—1—16	24—1—12			9—1—16		24—11—12	
—2—24	42—2—00			4—3—26		42—14—15	
—3—06	16—1—12			7—1—00		64—10—11	
—0—12	25—3—24			5—3—27		29—09—10	
—0—20	19—0—20			4—3—00		16—12—13	
—2—00	26—1—22			2—2—02		27—13—14	
39—3—22	154—3—06			34—3—15		206—09—11	

In the first of these Examples I begin at the Right hand, to wit, at the Denomination of Pounds, and stop at every 28, so many Pounds making a Quarter; that is, at every 28 I make a Speck on my Nail, (not in the Sum, for that Way is not proper or handsome) and I find two 28's, and 22 *lb.* over; wherefore I set down 22, and carry 2 *qrs.* to the Quarters, and adding them up find them 11, which is a Hundred and 3 *qrs.* over; wherefore I set down 3, and carry 2 to the Hundreds; which also added up, make 39; so that the Total Weight is 39 C. 3 qrs. and 22 lb. &c.

And for the Example of *Small Weight*, there I stop at 16 and 16, and at 10 in the Pounds, and find the Total 206 *lb.* 9 *oz.* and 11 *Drams.* There's no occasion for stopping but only at 28 in the Great Weight, and at 16 and 16 in the Small.

☞ *Note,* That in Weighing at the Water-side, or elsewhere, they do not weigh by the ~~Tun~~ in *Great Weight,* though some Goods are sold by it, as *Iron, Logwood, Cheese,* &c. but by Hundreds, Quarters, and Pounds, and afterwards computed by ~~Tuns,~~ &c. *Tons.*

Addition of Troy Weight.

By this Weight are weighed, *Jewels, Gold, Silver, Pearl, Electuaries,* and *Liquors*; a Pint of Water, Wine, &c. being a Pound, and the usual Denominations are *Pounds, Ounces, Penny-weights,* and *Grains,* as in the following Table, &c.

Note, That {
24 *Grains* make 1 *Penny-weight,*
20 *Penny-weights* 1 *Ounce,* and
12 *Ounces* 1 *Pound Troy.*
}

Note

Note alſo, That 25 *lb.* is a Quarter of a Hundred by the
Weight, 100 *lb.* is 1 hundred Weight, and 20 hundred
Ton Tun of Gold or Silver.

Examples of Troy-Weight.

6 Ingots of Silv. wt. *viz.*				10	12	20	24	10	20	24
Nº.	*l.*	*oz.*	*pw.*	*gr.*	*lb.*	*oz.*	*pw.*	*gr.*	*oz.*	*pw.*	*gr.*
1 Wt	4	05	12	10	14	06	10	11	204	10	14
2	5	04	16	17	24	10	11	12	96	07	17
3	3	11	19	20	21	06	07	17	100	11	12
4	4	06	07	12	21	10	12	14	56	16	20
5	5	01	11	12	16	11	12	13	212	10	23
6	4	11	12	13	21	07	06	17	96	19	12

28 06 00 12—122 05 10 12—767 17 02

In the Denomination of *Grains* I ſtop at 24, and find it
to amount to 3 *penny-weights* and 12 *grains* over; wherefore
I ſet down 12 *grains,* and carry three *penny-weights* to the
penny-weights; then I ſay, 3 that I carried and 2 is 5, and
1 is 6, and 7 is 13, and 9 is 22, and 6 is 28, and 2 is 30,
and then coming down with the Tens, I ſay, 30 and 10 is
40, and 10 is 50, *&c.* juſt as I do in *Addition of Money;* (ſince
as there 20 *s.* make a Pound, ſo here 20 *penny-weights* make
an Ounce) and find it to come juſt to 80; now in 80 there
are juſt 4 Twenties, or 4 Ounces; wherefore I ſet down 00
and carry 4 to the *Ounces,* and find them to amount to 42, which
makes 3 *Pounds,* and 6 *Ounces* over; wherefore I ſet down
6, and carry 3 to the *Pounds;* ſaying, 3 I carry and 4 is 7,
and 5 is 12, *&c.* and find they come to 28; ſo the Total is
28 *l.* 06 *oz.* 00 *pw.* 12 *gr.* and ſo of the reſt.

How to prove Addition.

IN all *Additions,* whether of ſimple Numbers, that is
Numbers of one Denomination; or in Examples com-
pound, that is, of diverſe Denominations, as *Pounds, Shil-*
Tons, lings, *Pence,* and *Farthings;* or Tuns, *Hundreds, Quarters*
and *Pounds,* Great Weight; or *Pounds, Ounces,* and
Drams, Small Weight; *Pounds, Ounces, Penny-weights*
and *Grains,* Troy-weight; I ſay, in any of the Examples a-
bove-mentioned, the trueſt and beſt Method of Proof, is to
caſt the ſame downwards (beginning at the Top) as you did
the ſame upwards, (beginning at the Bottom) and if it prove

same Total, the Work is infallibly right, and beyond any Contradiction; and is much better and more feasible than the common Method used in Schools, of making two Totals, by omitting the upper Line in the Second, which is altogether impracticable in real Business. I might here also give the several Examples of other *Additions*, such as *Apothecaries Weight*, *Cloth*, *Liquid*, *Dry*, and *Long Measures*, *Time*, &c. but the Method serves for any of them, having respect to the several Tables of Quantity belonging to those several Denominations of Addition above-mentioned, which are as follows, *viz.*

A Table of the Parts of Apothecaries Weight.

		Marks.
20 *Grains*	1 *Scruple.*	℈ a Scruple.
3 *Scruples*	1 *Dram.*	ℨ a Dram.
8 *Drams*	1 *Ounce.*	℥ an Ounce.
12 *Ounces*	1 *Pound.*	℔ a Pound.

By these Weights they compound their Medicines; but they buy and sell their Drugs by *Avoirdupois-Weight.*

Cloth-Measure.

4 *Nails*, or 9 *Inches*, 1 *qr.* of a *Yard.*
4 *qrs.* or 36 *Inches*, 1 *Yard.*
5 *qrs.* or 45 *Inches*, 1 *Ell English.*
3 *qrs.* or 27 *Inches*, 1 *Ell Flemish.*
6 *qrs.* or 54 *Inches*, 1 *French Ell.*

A Table of Wool-weight.

Note, That 7 *lb.* make 1 *Clove*, 2 *Cloves*, or 14 *lb.* 1 *Stone*, 2 *Stones* or 28 *lb.* 1 *Todd*, 6 *Todd* and ½ 1 *Wey* or 182 *lb.* 2 *Weys* or 364 *lb.* 1 *Sack*, and 12 *Sacks* 1 *Last*, or 4368 *lb.* 240 *lb.* 1 *Pack of Wool.*

Note, That 1 *lb.* 2 *oz.* 12 *pw. Troy*, is equal to a Pound *Avoirdupois.* And a Pound *Troy* is about 13 *oz.* 2 *Drams* and a half *Avoirdupois.*

			l.	*s.*	*d.*
A Pound of Weight *Troy*	} of Silver is worth	{	3	02	2
A Pound Wt. *Avoirdupois*			3	15	3½

100 *l.*	{ in Gold	} weighs	{ 1	11¾	} *Avoirdup. Wt.*
	in Silver		26	04	

A Pound *Avoirdupois* is heavier than a Pound *Troy*: But an Ounce *Troy* is heavier than an Ounce *Avoirdupois.*

A

A Table of Liquid Measure.

Liquid Measure is of two Sorts, *viz.* one for *Wine*, Bran
&c. and the other for *Beer* and *Ale.*

Wine, &c.

8 Pints 1 Gallon   2 Hogsheads 1 Pipe or Butt
42 Gallons 1 Tierce   2 Pipes or Butts 1 Tun,
63 Gallons 1 Hogshead   252 Gallons.
84 Gallons 1 Puncheon

Note, That *sweet Oyl* hath 236 Gallons to the Tun:
Oyl from *Greenland* hath 252 Gallons to the Tun.

Note, The Wine Gallon contains 231 Cubic or Solid Inch
by which all Liquids are measured, except Beer and Ale.

Beer Measure.

8 Pints 1 Gallon   2 Kilderkins   1   Barrel, or
9 Gallons 1 Firkin   Gallons
2 Firkins 1 Kilderkin   1 Barrel and half, or 54 Ga
                                    lons, 1 Hogshead.

Ale Measure.

8 Pints 1 Gallon   2 Kilderkins 1 Barrel, or
8 Gallons 1 Firkin of Ale,   Gallons
    Soap, or Herrings   1 Barrel and half, or 48 Ga
2 Firkins 1 Kilderkin   lons, 1 Hogshead.

Note, The *Beer* and *Ale* Gallon are the same *viz.*
solid Inches; but with this Difference, *i. e.* the Barrel
Beer contains 1228 Cubic Inches, or 4 Gallons more th
the Barrel of Ale.

In a Tun of Wine are
2 Pipes or Butts
6 Tierces
252 Gallons
504 Pottles
1008 Quarts
2016 Pints

In a Pipe or Butt are
2 Hogsheads
3 Tierces
126 Gallons
252 Pottles
504 Quarts
1008 Pints

In a Puncheon are
84 Gallons
168 Pottles
336 Quarts
972 Pints.

In a Hogshead are
63 Gallons
126 Pottles
252 Quarts
504 Pints

In a Barrel of Beer are
2 Kilderkins
4 Firkins
36 Gallons

Pottles   4 Firkins

Quarts   32 Gallons

Pints.   64 Pottles

In a Barrel of Ale are   128 Quarts

2 Kilderkins   256 Pints

Dry Measure.

2 Pints 1 Quart

2 Quarts 1 Pottle

2 Pottles 1 Gallon

2 Gallons 1 Peck

4 Pecks 1 Bushel Land Measure

5 Pecks 1 Bushel Water Measure

4 Bushels 1 Comb, or half Quarter

2 Combs 1 Quarter

4 Quarters 1 Chaldron

5 Quarters 1 Wey

2 Weys 1 Last, or 10 Quarter

4 Fatts or Vatts, or 56 Bushels, of Sea-Coal, 1 Chaldron; and 21 Chaldron is accounted a Score in the River of *Thames*; Salt and

Sea-Coal are heaped, or else there are 5 Pecks to the Bushel.

In the Last are

2 Weys

10 Quarters

80 Bushels

320 Pecks

1280 Pottles

2560 Quarts

5120 Pints

In a Wey are

5 Quarters

40 Bushels

160 Pecks

320 Gallons

640 Pottles

1280 Quarts

2560 Pints

Note, By an Act *Anno* 1712, the Bushel is 2178 Cubic Inches; and a Gallon of this Measure is $217\frac{1}{4}$ Cubic Inches.

Long Measure.

3 Barley Corns 1 Inch

12 Inches 1 Foot

3 Feet 1 Yard

3 Feet 9 Inches 1 Ell Engl.

5 Feet a Geometrical Pace

5 Yards and half, 1 Pole, Perch, or Rod

6 Feet a Fathom or 2 Yards

40 Poles, or 220 Yards 1 Furlong

8 Furlongs 1 Mile, or 1760 Yards

3 Miles 1 League

20 Leagues, or 60 Miles, 1 Degree; and 360 Degrees the supposed Circumference of the Earth and Sea.

In a Mile are

8 Furlongs   5280 Feet

320 Poles   63360 Inches

1760 Yards   190088 Barley Corns.

Land

Land-Measure.

5 Yards and half, 1 Pole, Perch, or Rod.
40 Poles make 1 Rod, or quarter of an Acre.
160 Poles in Length, and 1 in Breath, is 1 Acre.
80 Poles in Length, and 2 in Breadth, 1 Acre; and
40 Poles in Length, and 4 in Breadth, 1 Acre.
4 Poles in Length make 1 Chain.
10 Chains in Length, and 1 in Breadth, make 1 Acre.

Time.

60 Seconds 1 Minute		*In a Year are*
60 Minutes 1 Hour		
24 Hours 1 Day natural	31557600 Seconds
7 Days 1 Week	525960 Minutes
4 Weeks 1 Month	8766 Hours
13 Months, 1 Day, and 6	365 Days 6 Hours.
Hours, 1 Solar Year.	

Note, The Year is also divided into 12 Calendar Month
which contain 365 Days, according to this good old Verse,

Thirty Days hath September, April, June, *and* November
February *hath* 28 *alone, and all the rest thirty and one.*

SUBTRACTION.

THE next Rule in *Arithmetic* is *Subtraction* (or com
monly called *Substraction*) and this Rule teaches
take a lesser Number, or Sum, out of a greater, and shew
the Remainder, Rest, Excess, or Difference.

Note always to place the lesser Number under the grea
(with the same Care and Order as in *Addition*) so t
Units may stand under Units, Tens under Tens, &c. and t
Remainder under the Line is the Difference sought: A
such Difference being added again to the lesser Numb
shall make the greater Number, and is a certain Proof
the said Rule.

A General Rule.

Whatever you used to stop at in *Addition* (whether
one Denomination or of several) the same you must b
row in *Substraction,* when need requires: Remembring
pay, or carry 1 to the next Place towards the Left-ha
Example; Suppose Mr. *Andrews* owes to Mr. *Baker* 32
whereof Mr. *A.* hath paid to Mr *B.* the Sum of 14
in part; what remains due to Mr. *Baker?* ——

Answer 17

Here the leffer Number 146, ftands under the greater 323 ; and to find the Remainder, or Sum refting due, I fay, 6 from 3 I cannot ; but 6 from 13 (for you muft always borrow 10 of the next Figure in the fame under Line, and put it to the Figure or Cypher that ftands directly over the Figure you fubftract) and there remains 7 ; then 1 that I borrow and 4 is 5, for as I borrowed 10 (or 1) out of 4 fo I muft pay the faid 1 or 10 (for fo it really is, becaufe of the Decuple Proportion of Increafe from the Right-hand to the Left) to the faid Figure 4 again, as above hinted : I fay 5 from 2 I cannot ; but 5 from 12 (borrowing 10 and putting it to the over Figure 2, as above directed) and there remains 7 ; then 1 that I borrowed and 1 is 2, from 3 the over Figure, and there refts 1, and fo the Example is done ; and by it is fhewn that *A.* ftill owes *B.* 177 Pounds, as appears in the Work ; and for Proof of its Verity, add 177 the Remainder, to 146 the leffer of the two given Numbers, and it will make 323, being the fame with the greater Number, or Sum of Money firft due ; and therefore, a fure Proof of the Truth and Certainty of the Rule. And as *Subftraction* is proved by *Addition*, fo may *Addition* be proved by *Subftraction* : For if the two aforefaid Numbers, *viz.* 323 and 146, are added, their Total is 469 ; from which if you deduct 146, the Remainder will be the greater Number ; or if you fubftract 323 from the faid 469, the Remainder will be 146 the leffer Number.

All Examples or Sums in *Subftraction* of one Denomination, are performed as above, they varying not at all : But however, once more, for the better Explanation. Admit, a great Sheep-Mafter hath in all 6904 Sheep, and takes out of them 2490 to difpofe of at Market ; how many doth he leave behind ? To know this fet them down thus :

From — 6904 the Greater Number,
Take — 2490 the Leffer Number.

Anfwer— 4414 the Remainder.

Here I fay 0 from 4, and there remains 4 ; then 9 from nothing (or 0) I cannot ; but 9 from 10 (putting or making 0 10) and there remains 1 ; then 1 that I borrow and make 5 ; and 5 from 9, and there reft 4 ; and laftly, 2 from 6, and there remains alfo 4 (for I borrowed none, and therefore there's no Occafion of paying fo that he leaves behind him juft 4414 ; which put to the Number he takes

to

to Market, makes the Number he firſt had, *viz.* 6904, and ſhews the Deduction to be true, and the Anſwer right.

More Examples for Practice.

	l.	Yards.	Gallons.	Pounds.
From	4796	3700	47200	479672
Take	2929	1976	31976	97694
Rem.	1867	1724	15224	381978
Proof	4796	3700	47200	479672

Any Diſtance of Time that is from any particular Date of a Year, may be known by ſubtracting that Date from the preſent Date of the Year.

Example.

I. — 1742
1666 the Fire of *London.*

Since 76

II. — 1742
1588 the *Spaniſh* Invaſion

Since 154

III. — 1742
1605 Gun-powder Treaſon.

Since 137

Subtraction of divers Denominations.

Of Money.

	l.	s.	d.
Due ——	9	02	6
Paid ——	6	16	4
Reſts due —	2	06	2

Suppoſe Mr. *Campion* owes Mr. *Darnell* 9 *l.* 2 *s.* 6 *d.* and Mr. hath paid Mr. *D.* in part 6 *l.* 16 4 *d.* what remains due to Mr. *Darnell?* Anſwer, Due to Mr. *Darnell* 2 *l.* 6 *s.* 2 *d.* as by this Example

	10	20	12	4
	l.	s.	d.	

Sold for ——— 242—16—3 ¾

Paid in Part 174—12—6 ½

———————————————

Answer ——— 68—03—9 ¼

Again, Mr. *Edwards* sells to Mr. *Francis*, *Spanish* Wool to the Value of 242 *l.* 16 *s.* 3 *d.* ¾, and pays present Money, and by a Note on Mr. *Goodwin*, the Sum of 174 *l.* 12 *s.* 6 *d.* ½; what Money remains unpaid from Mr. *Francis?* Answer 68 *l.* 3 *s.* 9 *d.* ¼.

In the first of these Examples I say, 4 *d.* from 6 *d.* and there remains 2 *d.* then 16 *s.* from 2 *s.* I cannot, but borrowing one Integer of the next Denomination, or 1 Pound, which is 20 *s.* I say 16 from 20, and there rests 4, and taking the over Number 2, and putting it to the Remainder 4, makes 6; wherefore I put down 6 in the Place of Shillings, and say, 1 that I borrow and 6 is 7; now 7 *l.* from 9 *l.* there remains 2 *l.* so the Money resting due to Mr. *Darnell* is 2 *l.* 6 *s.* 2 *d.* as in the Example.

In the second Example I say, 2 Farthings (or a Half-penny) from 3 Farthings, and there remains 1 or ¼, which I set down in its proper Place, *viz.* under the Denomination of Farthings; then 6 from 3 I cannot, but 6 from 12, (as marked over the Denomination) and there remains 6, and 3 *d.* over it makes 9 *d.* which I place under the Line in its right place, *viz.* of Pence; then 1 that I borrowed (that is 1 Shilling) and 12 is 13; 13 *s.* from 16 *s.* and there rests 3, which I likewise set down under its own Rank; then 4 from 2 I cannot, but 4 from 12 (borrowing 10, as in *Addition* I carry 1 for every 10) and there rests 8; then 1 that I borrow and 7 makes 8; 8 from 4 I cannot, but 8 from 14, and there remains 6; so that the Sum remaining due is 68 *l.* 3 *s.* 9 *d.* ¼, as in the Work. And for its Proof, you must add the Remainder, 68 *l.* 3 *s.* 9 *d.* ½ to the lesser, under Sum, 174 *l.* 12 *s.* 6 ½, and it makes 242 *l.* 16 *s.* 3 *d.* ¾, the Sum first due, and is a Proof of the Work's being Right. See the Example above.

E,

More

More Examples for Practice.

	10	20	12 4	10	20	12	10	20	12
	l.	*s.*	*d.*	*l.*	*s.*	*d.*	*l.*	*s.*	*d.*
Due —	174	16	6 ¼	74	10	4	2471	07	0
Paid—	97	12	4 ¾	29	12	9	1976	16	6
Remain	77	04	1 ½	.44	17	7	494	10	5
Proof	174	16	6 ¼	74	10	4	2471	07	0

	10	20	12	10	20	12	10	20	12
1st Due —	74	00	00	274	16	6	796	00	0
Paid ——	46	12	10	197	19	4	279	11	7
Balance	27	07	02	76	17	2	516	08	5
Proof —	74	00	00	274	16	6	796	00	0

Sometimes a Sum owing may be paid at several Times; then the several Payments muft be added together, and their Total deducted from the Sum firft due, as in this and the Examples following.

Owing —— 266 *l.*

Paid at Times —
{ 20
15
30
90
17
24
60 }

Paid in all 256 *deduct*

Refts due 10

Proof 266

	l.	s.	d.			l.	s.	d.
More due —	249	12	0	Received —		100	10	0

Received at several Times	l.	s.	d.	Paid to several Persons	l.	s.	d.
	24	12	6		6	16	0
	9	14	9		10	00	0
	20	00	0		5	12	6
	16	16	6		20	10	0
	22	10	2		7	09	6
	13	12	6		9	08	6
	7	16	4		7	12	9

Received in all	115	02	9	Paid in all	67	09	0
Rests due	134	09	3	Remains in the Bag }	33	01	0
Proof	249	12	0				

10	20	4	28	10	4	28	10	16	16
Tuns.	C.	qrs.	lb.	C.	qrs.	lb.	lb.	oz.	dr.
From 44	12	1	10	246	2	12	146	02	10
Take 39	14	2	06	164	3	22	97	10	12
4	17	3	04	81	2	18	48	07	14
Proof 44	12	1	10	246	2	12	146	02	10

Troy-Weight.

10	12	20	24	10	20	24
lb.	oz.	pw.	gr.	oz.	pw.	gr.
From 462	04	10	11	1247	10	12
Take 196	09	06	16	976	16	17
Remain 265	07	03	19	270	33	19
Proof 462	04	10	11	1247	10	12

And so much for _Subtraction_; which Method will serve for any Denomination whatever, having respect to the seve-ral Tables of Quantity, as before hinted in _Addition_.

E 2

MUL-

MULTIPLICATION.

THE next Rule in order is *Multiplication*, and perhaps the moſt ſerviceable Rule in Buſineſs, for its quick Diſpatch, of all others in *Arithmetic*; and I ſhall endeavour to ſhew, by its Nature, Quality, and Uſe, that it is ſo. And,

1. *Multiplication* is a Rule that from two Numbers given, teacheth to find out a third, which ſhall contain either of the two as many times as the other containeth Units.

2. In ſome Caſes *Multiplication* is alſo a compendious Working of *Addition*.

3. It ſerves likewiſe to bring great Denominations into ſmall, as Pounds into Shillings, Pence, or Farthings.

4. Having the Length and Breadth of a plain Superficies, we find its Contents in Square Meaſure.

5. By *Multiplication* we find by having the Value of one Thing, or the Wages of one Perſon, how to know the Value of many Things, or the Wages of many Perſons.

In *Multiplication* we are particularly to take Notice of theſe three Terms, *viz.*

The $\left\{\begin{array}{l}\textit{Multiplicand,}\\ \textit{Multiplier, and}\\ \textit{Product.}\end{array}\right.$

1. The *Multiplicand* (generally the greater of the two Numbers) is the Number to be mutiplied.

2. The *Multiplier*, (generally the leſſer of the two Numbers) is the Number to multiply with.

3. The *Product*, or Reſult of the Work, being the Anſwer.

But before any Proceedure can be made in this Rule, it is neceſſary to have the following Table by Heart, and that very perfectly.

The Multiplication Table.

1	2	3	4	5	6	7	8	9	10	11	12
2	4	6	8	10	12	14	16	18	20	22	24
3		9	12	15	18	21	24	27	30	33	36
4			16	20	24	28	32	36	40	44	48
5				25	30	35	40	45	50	55	60
6					36	42	48	54	60	66	72
7						49	56	63	70	77	84
8							64	72	80	88	96
9								81	90	99	108
10									100	110	120
11										121	132
12											144

This Table is so plain and easy, that there is no need of direction; for 'tis but guiding the Eye from the side Column in the Head, and in its opposite Angle or Square you have the Answer; and contrarywise by directing the Eye from the Head to the Side, you have the same; as 6 times 9 is 54, and 9 times 6 is 54; so 7 times 8 is 56, and 8 times 7 is 56, &c. And so it ought to be got by heart for the more dextrous Readiness in multiplying.

Now for Application.

Example 1. How many is 3 times 472? Which must be set down in the Margin; and then say, 3 times 2 is 6, which place under 3 the Multiplier; then 3 times 7 is 21; set down 1 under 7, and carry 2 for the two Tens, as in *Addition of one Denomination*; then 3 times 4 is 12, and 2 is 14; which set down

472
3
——
1416
——

E 3

down, and the Product is 1416 ; that is, 3 times 472 make
ſo much ; and may be proved by *Addition*, by ſetting down
472 three times, in Additional Order, and caſting it up
which makes the Aſſertion good in the ſecond Definition, that
this Rule compendiouſly performs the Office of Addition.
Likewiſe the foregoing Example agrees with the firſt Defini-
tion ; for as 3 times 472 makes 1416, ſo doth 472 times
make the ſame, *viz.* 1416.

    Example 2. Again, how many makes 742 multiplied
by 4 ?

742 *Multiplicand.*   Here I ſay, 4 times 2 is 8, and 4 times
  4 *Multiplier.*   4 is 16 ; 6, and carry 1 ; and 4 times
              7 is 28, and 1 is 29, which ſet down ;
2968 *Product.*   ſo the whole Product is 2968, as per
              Example.

    More Examples of one Figure in the *Multiplier*, are
theſe, *viz.*

Multiplic.	7420	4414	7460	90704	5678
Multiplier	5	6	7	8	9
Product	37100	26664	52220	725632	51110

Compound Multiplication,

    Is when the *Multiplier* conſiſts of two, three, four, or
more Figures, or Figures and Cyphers.

    And here you muſt begin with that Figure which is in
the Place of Units of the *Multiplier*, and go through the
whole *Multiplicand*, by multiplying each Figure of it firſt
by that ſaid Unit Figure, then by the next, to wit, by the
Figure in the Place of Tens of the *Multiplier*, then with the
third, *&c.* to the laſt ; always remembring to place the firſt
Figure of every Product or Line, (for you will ever have as
many as you have ſignificant Figures in the *Multiplier*) I ſay
remember to place the firſt Figure of each Line exactly and
perpendicularly under the Figure you multiply by ; and
then add the ſeveral Lines or Products together, which
collected gives the total Product required, as in the Example
following, *viz.*

Example 1.

How many is, or are, 23 times 7426? firſt I begin with the Unit Figure 3 in the *Multiplier*, ſaying 3 times 6 is 18; 8 (which I ſet directly under 3 by which I multiply) and carry 1; then 3 times 2 is 6, and 1 is 7; ,then 3 times 4 is 12; 2 and carry 1; then 3 times 7 is 21 and 1 is 22: and ſo I have done with the firſt Figure of the *Multiplier*, viz. 3. Then I go to the next, that is 2, and twice 6 is 12; 2 and carry 1, (which 2 is placed in a direct Line under 2, the multiplying Figure) then twice 2 is 4, and 1 is 5; then twice 4 is 8; and laſtly twice 7 is 14, which I ſet down: Then I add the two Products together, ſaying, 8 is 8, &c. and the Total is the right and proper Product, or Reſult of the Multiplication, viz. 170798. Again,

```
    7426
      23
  ------
   22278
   14852
  ------
  170798
  ------
```

Example 2.

What is the Reſult or total Product of ———— 527527
Multiplied by ———— 285

It will appear too prolix, and altogether unneceſſary, to give more verbal Directions; nay, indeed nauſeous Tautology, ſince thoſe given above are ſufficient; and therefore the Learner is referred to the Obſervation of the Example, as alſo to thoſe two that follow, viz.

```
   2637635
   4220216
   1055054
  --------
 150345195
  --------
```

```
    527535              275827
     15728               19725
   --------            --------
  4220280             1379135
  1055070              551654
  3692745             1930789
  2637675             2482443
   527535              275827
  --------            --------
829707.0480         5440687575
  --------            --------
```

When Cyphers are intermixed with Figures in the *Multiplier*, then multiply by the Figures as above; and when you come to a Cypher in the *Multiplier*, then ſet down another Cypher exactly and perpendicularly under it, then begin the *Multiplicand* again with the next Figure to the Cypher in the

　Multi-

Multiplier, and go through it in the fame Line, placing the
firſt Figure of that Product next to the Cypher towards the
Left-hand, but then heed muſt be taken that the next Figure
or Cypher of the next Line muſt be ſet down one Degree
farther towards the Left hand, and not immediately under
the laſt Figure ſet down next to the Cypher: As in the fol-
lowing Examples may be fully underſtood.

24393	7864371	327586
402	23604	6030
48786	31457484	9827580
975720	471862260	19655160
	23593113	
9805986	15728742	197534356
	185630613084	

When you have a Cypher or Cyphers in the *Multiplier,*
at the Beginning towards the Right-hand, then ſet it, or
them, backwards from the Place of Units towards the Right-
hand; and when you have multiplied by the Figure or Fi-
gures, annex the Cypher or Cyphers: *As in theſe Examples,*

4762	47962	4632
70	400	2600
333340	19184800	27792
		9264
		12043200

If you have Cyphers both in the *Multiplicand* and *Multi-
plier,* then neglect the Cyphers in both, and multiply by
the Figures, and annex the Cyphers at laſt: *As in theſe
Examples.*

42600	42300	376400
220	12000	2400
852	846	15056
852	423	7528
9372000	507600000	903360000

Whe

When you are to multiply by 10, 100, 1000, or 10000, 'tis only adding or annexing so many Cyphers to the *Multiplicand*, that is, either 1. 2, 3, or 4 Cyphers and the Work is done. *Example*, Suppose I am to multiply 375 by the Numbers above; if I multiply it by 10, then I join 0 to 375, and then it makes, or the Product is 3750: If by 100, then I annex 00, and then it makes 37500: If by 1000, I put to it 000, and then it produces 375000: And lastly, if by 10000, I then add 0000, and then it makes 3750000, *&c.* And thus may any Number be multiplied, when the *Multiplier* consists of a Unit with any Number of Cyphers, and done by Inspection only, without any formal setting down the *Multiplicand* with a Line drawn under it, *&c.*

Thus far for Direction in the Manner how to multiply; the next will be to shew the Uses of *Multiplication* in real Business, and how to apply it on proper Occasions, *viz.*

1. Suppose you want to know how many half Crowns there are in 246 *l.* you know that 8 half Crowns make 1 *l.* wherefore set them down thus:

$$246 \, l.$$
$$\text{Multiply by} \quad 8$$
$$\overline{\text{Answer} \quad 1968}$$

Again, in 1968 Half Crowns how many Pence?
30 Pence in half a Crown.

59040 Pence the Answer.

And this serves to make out, that great Denominations are brought into smaller by this Rule, according to the third Definition.

2. Admit you wanted to know the Contents of a large Shuffle-Board Table, 34 Foot long, and 4 Foot wide, multiply 34 the Length, by 4 the Breadth, and the Answer will be 136 square Feet for the true Contents of such a Table. And this agrees with the 4th Definition of this Rule.

3. If I know the Value of a Yard of Broadcloth to be 14 Shillings, what is the Value of 220 Yards of the said Cloth in Shillings?

                           220
                Multiply by 12
                           ———
                           440
                       22
                       ———
                   2640 Shillings, or 132 Pounds.
                   ————

If the Wages of 1 Seaman be 23 Shillings a Month, what
is the Wages of 250 Seamen for the same Time ?
        Multiply by   23
                       ———
                       750
                   500
                   ————
        Answer 5750 Shillings, or 287 *l.* 10 *s.*
               ————

And these two Examples accord with the fifth Definition,
or Use of this Rule.

And thus much for plain *Multiplication.*

I shall, in the next Place, say some small matter concern-
ing *Multiplication of Money,* and a little of its Use, and so
conclude this Rule.

Multiplication of Money.

Multiplication of Money (what most would learn above
any thing) hath great Affinity with *Addition of Money*; the
same Method being taken in carrying from one Denomina-
tion to the next, *viz.* from Farthings to Pence, from Pence
to Shillings, and from Shillings to Pounds.   And as in *Ad-
dition* (and other *Multiplications*) you begin at the Right-
hand, and proceed towards the Left ; so here you begin at
the least Denomination, which is also at the Right-hand.

This Method of accompting is the most apt and expedi-
tious of all others, for small Quantities ; and therefore ex-
treamly necessary in making Bills of Parcels, &c.   And is
beyond all Contradiction, as sure and certain as any way
whatsoever.

The General Rule,

Is always to multiply the Price by the Quantity.

The first step is, for Quantities from 2 to 12 ; and this is
done by one Multiplier ; as in the Examples following.

                                          Examp.

Example 1.   *l.   s.   d.*

Multiply ————————————————————— 7—12—6
(or 6 Pieces of Cloth at *l.* 7—12—6 *per* Piece) by   6

                                        45—15—0

Here I say 6 times 6 is 36 Pence, which is juft 3 *s.* I fet
down 0 in the Place of Pence, and carry 3 *s.* to the Place
of Shillings, (exactly the fame as in *Addition of Money*)
then 6 times 12 is 72, and 3 is 75 *s.* or 3 *l.* 15 *s.* where-
fore I fet down 15 in the Place of Shillings, and carry 3 to
the Pounds ; then 6 times 7 is 42, and 3 is 45 *l.* So the
whole amount of the 6 Cloths, at 7—12—6 *per* Cloth, is
45 *l.* 15 *s.* as in the Work, and very concife.

Example 2.

Again, How much is 9 times 13 *s.* 4 *d.* or what is the
Amount of 9 Marks ?   9

In this Example I fay, 9   ———————
times 4 is 36 *d.* or 3 *s.* I fet   6—00—0 *Anfwer.*
down 0, and carry 3 ; then ———————
9 times 3 is 27, and 3 makes 30 ; I fet down 00, and car-
ry 3 (as in Multiplication of fimple Numbers ;) then 9
times 1 is 9, and 3 is 12 ; which being the Tens of Shil-
lings, confequently they are Angels ; which being halved,
make juft 6 *l.* and fo much is the Value of 9 Marks, or
any thing elfe at that Price, *viz.* 13 *s.* 4 *d.*

Example 3.

Once more ; What comes 12 Gallons of Wine to at
5 *s.* 4 *d. per* Gallon ?   *s.   d.*

                                              5—4
Here I say, 12 times 4 is 48 ; 0 and   12
carry 4 ; then 12 times 5 is 60, and 4   ———————
is 64 *s.* or 3 *l.* 4 *s.* &c.   *l.* 3—4—0

                                        ———————

The next Degree or Step of Advance in this Way of
Reckoning, is of Quantities exceeding 12, even to 12 times
12, or 144; all which, as far as 144, are found in that
excellent Table, the *Table of Multiplication* ; which is a
ready Help to all Purpofes of Reckoning, and particularly
in this Way : And that you may proceed with Dexterity,
you muft be very ready in the faid Table, that you may be
immediately apprehenfive what component Parts hit your
Quantity propofed, or pretty near it, (for any Quantity be-
                                                      low

low 12 needs no Recollection at all, as in two of the Examples foregoing) and then work accordingly ; as 15 Yards at, &c. I readily know that 3 and 5, or 5 and 3, are to be my Multipliers. If to 21, then 3 and 7, or 7 and 3, as above. If to 30, then 5 and 6, or 6 and 5 ; also 3 and 10, or 10 and 3. If to 45, 48, 56, 66, 72, 96, &c. then 5 and 9, 6 and 8, 7 and 8, 6 and 11, 6 and 12, and 8 and 12, &c. are to be Multipliers, and exactly hit their several Quantities of which they are component Parts ; and Examples of this Kind have two Multiplications for their Solution.

When the Quantity proposed is a Number Irregular, or such a Number that no two Numbers in the Table can be found to answer it, then we must multiply by two such Numbers as come pretty near it, as is said above ; and for the Number wanting, to make up the Number or Quantity proposed, multiply the given Price of one by the Number that is wanting, which will make three Products by three Multiplications ; which last Product must be added to the foregoing Products resulting from two Multiplications, and the Total will be the Answer.

And first, I shall shew Examples of the second Step, *viz.* of Regular Quantities that exceed 12, and are precisely answered at two Multiplications, such as mentioned above, *viz.*　　　　　　　　　　　　　　　　　　　　　*s. d.*

What comes 15 Yards of Muslin to, at 3—5 *per* Yard ?　　　　　　　　　　　　　　　　3 and 5

Here 3 times 5 is 15 *d.* or 1 *s* 3 *d.* ——————
3 and carry 1 *s.* then 3 times 3 is 9,　　10—3
and 1 is 10 *s.* so the first Product is　　　　5
10 *s.* 3 *d.* which I multiply by 5, say-——————
ing 5 times 3 is 15 *d.* or 1 *s.* 3 *d.* 2—11—3
3 and carry 1 ; then 5 times 10 is 50, ——————
and 1 is 51 *s.* or 2 *l.* 11 *s.* So the whole Amount of 15
Yards, at 3 *s.* 5 *d. per* Yard, is 2 *l.* 11 *s.* 3 *d.* And demonstrable thus, *viz.* If 10 *s* 3 *d.* be the Value of three times 3 *s.* 5 *d.* then 5 times the Value of 10 *s.* 3 *d.* must of necessity be 15 times the Value of 3 *s.* 3 *d.* because 5 times 3 is 15 : And its Truth may be proved by *Addition* and *Multiplication*, thus ; set down 3 *s.* 5 *d.* three times in Additional Order, and put the three Lines together, and the Total of them multiply by 5, as before, and the Answer will be the same. Or set down 17 *s.* 1 *d.* (the Product

duct of 3 *s.* 5 *d.* multiplied by 5) three times alſo, and add them together, and the Total will be exactly the ſame with the Reſult by Multiplication ; as in the following Specimen of Work.

(1)	(2)	
s. *d.*	*s.* *d.*	*s.* *d.*
3—5	3—5	17—1
3—5	5	17—1
3—5	———	17—1
———	17—1	———
10—3		2—11—3
5		
———		
2—11—3		

Here the firſt of theſe two Proofs is worked by *Addition* and *Multiplication*, and the ſecond by *Multiplication* (as *per* Margin) and *Addition*. Alſo,

By this we ſee, that in all Examples under this Head, we are to pitch on two Numbers (for *Multipliers*) in the Table ; which multiplied together, make the Quantity propoſed ; and then we are to multiply the Price by one of the Numbers (it matters not by which firſt) and then that Product is to be multiplied by the other Number, and the ſecond or laſt Product will be the Anſwer.

Example 2.

Again, What is the Value of 21 Gallons of Brandy ?

s. *d.*
at   7—9 *per Gallon.*
7 and 3
———
2—14—3
3
———
8—02—9
———

In this Example I ſay, 7 times 9 is 63 *d.* or 5 *s.* 3 *d.* I ſet down 3 and carry 5 ; then 7 times 7 is 49, and 5 is 54 *s.* or 2 *l.* 14 *s.* So the firſt Product is 2 *l.* 14 *s.* 3 *d.* which I multiply by 3, and that produces the laſtProduct orAnſwer, *viz* 8 *l.* 2 *s.* 9 *d.*

Now follow a few more Examples of this Sort, without any verbal Directions, becauſe I think thoſe already given to be ſufficient.

Example

Example 3.

What comes 30 Ells of
Holland to,   *s.* *d.*
at   3—7 *per Ell.*
            10 and 3

     1—15—10
          3

Answer 5—07—06

Example 4.

45 Pound of Raw Silk,
         s. *d.*
at   15—6 *per lb.*
           5 and 9

    3—17—6
        9

Answer 34—17—6

In the first Product of
this Example I say, the
half of 7 is 3 and half, or
30 *l.* 10 *s.* And in the
last, the half of 15 is 7
and half, for 7 *l.* 10 *s.*
&c.

Example 5.

56 Bushels of Wheat,
        s. *d.*
at   4—9
          7 and 8

    1—13—3
        8

Answer 13—06—0

Example 6.
        s. *d.*
72 Broad Pcs. at 23—6 *each.*
           12 and 6

    14—02—0
        6

    84—12—0

In the first Product the half of
28 Angels is 14 *l.* &c.

Example 7.

108 *lb.* of Indigo Lahore,
at   7 *s.* 8 *d.*
         9 and 12

    3—9—0
       12

Answer 41—8—0

Example 8.   *l.* *s.* *d.*
96 *C.* of Currants, at ——— 2—13—6 *per C.*
              8 and 12

    21—08—0
       12

Answer 256—16—0

The next Gradation of Advance is of Quantities irregular, or of Numbers that are not to be answered precisely at two *Multiplications :* In this Case, there ariseth no Increase of Difficulty, but it is as easy as the Examples foregoing ; only here you will have an Addition of one Line more, occasioned by bringing down the Price of one to be added to the last Product ; or else a Line more made by multiplying the Price by what is defective or wanting in the Number by two Multiplications, to make up the proposed Quantity compleat ; as it may be of 2, 3, 4, 5, &c. as by the subsequent Examples may be seen and understood.

Example 1. What is the Product of 2 *l.* 13 *s.* 6 *d.* multiplied by 39 ?

l. 2—13—6	Here I find that 6 multiplied by 6, makes 36 ;
6 and 6	which is within 3 of the
——————	Quantity proposed ; wherefore I multiply by 6, and
16—01—0	that Product again by the
6	other 6 ; the last Product
——————	is 96 *l.* 6 *s.* which is the
96—06—0	Value of 36 ; but we want
8—00—6	to know the Value of 39 ;
——————	wherefore I multiply the
104—06—6	

Price of one, *viz.* 2 *l.* 13 *s.* 6 *d.* by 3 that is defective or wanting to make up 36 to 39, saying, 3 times 6 is 18 *d.* &c. And find that 3 times 2 *l.* 13 *s.* 6 *d.* is 8 *l.* 00 *s.* 6 *d.* which added to 96 *l.* 6 *s.* 0 *d.* the Total gives the compleat Value of 39 ; for 36 and 3 makes 39. See the Work.

Example 2. What comes 79 C. wt. of Cheese to, at 28 *s.* per C. weight ?

l. *s.* *d.*	In this Example I say,
28—0	7 times 0 is 0 ; then 7
7 and 11	times 8 is 56 ; 6 and carry 5 ; and 7 times 2 is 14,
——————	and 5 is 19 ; the half of
9—16—0	which is 9 and half or 9 *l.*
11	10 *s.* 0 *d.* So the first Product is 9 *l.* 16 *s.* 0 *d.* which
——————	multiplied by 11, produces
107—16—0	107 *l.* 16 *s.* 0 *d.* or the Value of 77 ; then for 2 wanting
2—16—0	I multiply the Price by
——————	
110—12—0 *Answer*	

it, and that gives 2 *l.* 16 *s.* 0 *d.* which added to 107 *l.* 16 *s.*
0 *d.* makes the whole Value of 79, *viz.* 110 *l.* 12 *s.* 0 *d.*
as in the Work. Or, as there are no Pence in the Price,
you may multiply 28 *s.* by 79 without bring-
ing it into Pounds as you work it, but omit it
till the laſt, and then cut off or ſeparate
the laſt Figure or Cypher of the Product
towards the Right-hand, and halve thoſe to-
wards the Left, which Half will be Pounds,
and the Figure cut off Shillings, as in this
Example.

<div style="text-align:right">

s.
28
79
———
252
196
———
221,2
———
l. 110,12

</div>

The half of 2 is 1, and the half of one is 0, which
joined to the 2 ſevered from 221, makes 12 ; ſo the Anſwer
is 110 *l.* 12 *s.* as before.

Example 3. 112 Pound of Sugar at 5 ½ *per lb.* ſet down
thus :

   s.   *d.*
     5½ *per* Pound.
     10 and 10
————————
   4—07
     10
————————
2—05—10
   05—06 the Product of 5 *d.* ½ by 12 defective.
————————
2—11—04 the Anſwer.

Here after I have multiplied by 10 and 10, the Parts of 100,
there wants 12 ; wherefore I multiplied 5 *d.* ½ by 12, and
it gives 5 *s.* 6 *d.* for 12 *lb.* at 5 *d.* ½, which added to 2 *l.*
5 *s.* 10 *d.* the Value of 100, makes 2 *l.* 11 *s.* 4 *d.* the true
Value of 112 *lb.* at 5 *d.* ½ *per* Pound.

Example 4. 94 Stone of Beef, at 22 *d.* or 1 *s.* 10 *d. per* Stone.

| 1 *s.* | 10 *d.* |
| 10 and 9 |

|---|
| 18—04 |
| 9 |

| 8—05—00 |
| 7—04 |

8—12—04 Anſwer.

Here what is wanting, after the two Multiplications, is 4 ; wherefore I multiply 1 *s.* 10 *d.* (the Price) by 4, which produces 7 *s.* 4 *d.* to be added, &c.

Example 5. 97 C ½ of Raiſins,

| *s.* | *d.* |
| at 25—06 *per* C. |
| 9 and 10 |

| 11—09—06 |
| 10 |

| 14—15—00 |
| 8—18—06 |
| 12—09 for the ½ C. |

124—06—03

After I have multiplied by 9 and 10, I multiply the Price 25 *s.* 6 *d.* by the Quantity wanting, and it produces 8 *l.* 18 *s.* 6 *d.* then for the half C. I take half of the Price; which is 12 *s.* 9 *d.* and then collect the three Lines, the Total of which is 124 *l.* 6 *s.* 3 *d.* for the Anſwer.

Note, From the laſt Example may be obſerved, that there is no need of too much Solicitude concerning coming ſo very near by two Multiplications, for there 7 is wanting to make up the true Quantity ; nay, if the two Multiplications fall ſhort by 10 or 12, it is near enough ; for 'tis as eaſy to multiply the Price by 10 or 12, as by 2 or 3, and the Addition is the ſame.

110 *Example* 6. Once more ; What comes ~~120~~ C. ¾ of Hop
to, at 4 *l.* 10 *s.* 6 *d. per* C ?

l.	*s.*	*d.*
4	10	06

10 and 10

45	05	00

10

452	10	00
45	05	00
2	05	03
1	02	07½

501	02	10½	Anſwer

After I have multiplied by 10
and 10, which makes 100,
multiply the Price, 4 *l.* 10 *s.* 6 *d.*
by 10 that is wanting, which
gives the ſame with the firſt Pro-
duct, *viz.* 45 *l.* 5 *s.* 0 *d.* which
ſtands under the Product by 100;
and for the ¾ of a C. I take
of the Price, *viz.* firſt the half,
and then the half of that half,
that is, 2 *l.* 5 *s.* 3 *d* and 1 *l.*
2 *s.* 7 *d.* ½ ; which four Lines
added together, make 501 *l.* 2 *s.*
10 ½ for the Anſwer.

To prove Multiplication.

Whether of Simple Numbers, or of Money ; it is moſt
ſurely done by *Diviſion* ; but before that is known, take
this Method, *viz.* As you mutiplied the *Multiplicand* by
the *Multiplier*, ſo contrarywiſe multiply the *Multiplier* by
the *Multiplicand* ; and if the Products are alike, the Work
is right ; or otherwiſe one of them is wrong, and muſt be
gone over again till they do agree.

Example 1.

365 Days in a Year.
24 Hours in a Day.

1460
730

8760

Here (reverſely) I ſay, 5 times 4 is 20 ; 0 and carry 2 ;
6 times 4 is 24, and 2 is 26 ; 6 and carry 2 ; and 3 times
4 is 12, and 2 is 14. Then 5 times 2 is 10 ; 0 and carry
1 ; 6 times 2 is 12, and 1 is 13 ; 3 and carry 1 ; and 3
times 2 is 6, and 1 is 7. Which Products added together
make 8760, the Hours in a Year, without taking in the
odd 6 Hours, which the Year doth conſiſt of more than
365 Days.

Exam

Example 2.

16 Gallons of Spirits at	I say here, twice 7 is 14; 2
s. d.	and carry 1 *s*. and 3 times 7 is 21,
3—2 *per* Gallon.	and 1 is 22 *s*. or 1 *l*. 2 *s*. Again,
7 and 8	twice 8 is 16 *d*. 4 and carry 1 *s*. and
	twice 8 is 16, and r is 17 *s*. 17 and
—02—2	carry 0; and once 8 is 8 *l*. Thus
8	both these Examples are the same
	in consequence as if you proceed-
—17—4 Answer	ed in the common and regular
	Method of *Multiplication*, and shews
	the Truth of Operation.

The next Rule in order, of course, is

DIVISION.

THIS Rule, though accounted the hardest Lesson in *Arithmetick*, yet I shall make it easy and intelligible to the meanest Capacity.

The Use of this Rule is to know how many times one Number or Sum is contained in another; as if it were asked how often is 9 contained in 54 ? the Answer is 6 times; or, how many times 12 is there in 144 ? Answer, 12 times.

As by *Multiplication* great Names or Denominations are brought into small; so contrarily, by *Division*, small Names are brought into greater; as Farthings (from one Gradation to another) into Pounds, Pounds Weight into Tuns Weight, and Gallons Liquid into Tuns Liquid, &c.

In this Rule we are to take particular Notice of these three certain Terms following, *viz.*

1. } *Dividend*, or Number to be divided.
2. } The { *Divisor*, or Number by which we divde.
3. } *Quotient*, or Answer to the Work ; which shews how often the Divisor is contained in the Dividend.

4. The *Remainder* ; which is an uncertain Branch of this Rule, because there is sometimes a Remainder, and sometimes not. ☞ And you must particularly note, That the *Remainder* is ever of the same Name with the *Dividend*, and is always less than the *Divisor* ; for if it be more, or equal to the *Divisor*, the Work is wrong.

Division is either Single or Compound ; *Single*, when the *Divisor* consisteth of a single Figure, and the *Dividend* of

tw

two at most : Any of this fort is anfwered by the *Multiplication Table* ; as if 63 were to be divided by 7, the Anfwer will be 9 times. Here 63 is the *Dividend,* 7 the *Divifor,* and 9 the *Quotient* or *Anfwer.*

Compound Divifion is when the *Dividend* hath many, or more Figures or Cyphers than Two, and the *Divifor* one or more Figures or Cyphers, *&c.*

Example.

How many Times 7 is there contained in 365 ? Or, how many Weeks in a Year ?

$$7) 365 (52$$
$$35$$
$$\overline{}$$
$$15$$
$$14$$
$$\overline{}$$
$$(1)$$

A General Rule for Working.

$$Note \begin{cases} 1.\ \text{Seek,} \\ 2.\ \text{Mult ply,} \\ 3.\ \text{Subftract.} \end{cases}$$

Having fet down the Example with two crooked Lines, or half Parenthefis, one for the Divifor, and the other for the Quotient, I begin according to the afore-mentioned general Rule for Working, by feeking or afking how often I can take 7 the *Divifor,* out of 36 the two firft Figures of the *Dividend* (for I cannot take 7 out of 3, the *Quotient* being never to begin with o) and the *Anfwer* is 5 times; wherefore I place 5 in the *Quotient,* and multiply the *Divifor* 7 by it (as directed in the *General Rule*) faying, 5 times 7 is 35, which I place under 36 ; and then thirdly, according to the faid Rule, I fubftract 35 from 36, and there remains 1 ; to which I bring down the next, or laft Figure of the *Dividend, viz.* 5 and then there is 15 for a new *Dividend,* or *Dividual* to work upon ; then I afk or feek again, how oft 7 may be taken in 15 ? and the Anfwer is 2 times ; wherefore I put 2 in the *Quotient* next to the 5 ; by which 2 I alfo multiply the *Divifor* 7, faying, twice 7 is 14 ; which I fet down under 15, and fubftract, and there remains 1, which I place between two Semi-circles thus, (1) as it ftands in the Work ; where obferve, That 365 is the *Dividend,* 7 the *Divifor,* 52 the *Quotient,* or *Anfwer,* and 1 the *Remainder :* The *Quotient* declares that 7 is contained in 365, 52 times, and 1 over, or remaining ; which I fet over the *Divifor,* thus, $\frac{1}{7}$, and fignifies that there is one feventh of a Week, or 1 Day, more than juft 52 Weeks in a Year, or 365 Days ; which is eafily

y to be found by collecting the Days of each Calendar
onth as they ſtand in the Almanack.

You may Note, That the ſaid $\frac{1}{7}$ one ſeventh is properly
hat is called a *Fraction,* or a Piece or Segment of the *Di-*
dend; but of this hereafter.

Note alſo, That if there had been more Figures or Cy-
ers in the *Dividend,* they muſt have all been brought
own, one by one at a time (and never but one at a time)
d (after *Subtraction*) ſet to the *Remainder*; and if there
mains o, you muſt ſtill bring down but one Figure or
ypher at a time; and for every Figure or o ſo brought
own there muſt be a Figure or o placed in the *Quotient,*
cording to the times you can take the *Diviſor* out of the
veral *Dividuals* you make, by drawing down a Figure or
ypher at a Time out of the *Dividend,* till all be brought
own, and the Work ended.

For a Specimen, let us divide 8060 Pounds of Tobacco
ually among 8 Men.

8) 8060 (1007 *Quotient.*
  8 ···
  ―――――
   60
   56
  ―――――
   (4)

Here I ſay the Eights in
8 once; which I put in the
Quotient then the Eights
in o, o times; which I
likewiſe put in the Quo-
tient; then the Eights in
6, o times again; which is
ſo placed in the Quotient, and there remains 6; to which
bring down o, the laſt of the Dividend, and it makes 60;
ſtly, the Eights in 60 7 times, and 7 times 8 is 56 from
o, and there remains 4; ſo the Quotient ſhews that each
erſon muſt have 1007 Pounds of Tobacco for his Share in
he Dividend 8060, and there remains 4 Pounds over and
bove, which makes half a Pound more due to each Man,
ecauſe 4 the Remainder is half of 8 the Diviſor: And ſo
he Work is done, the Quotient giving to each Man 1007
ounds and half for his equal Share.

Note, That in the Operation, every time that you bring
own a Figure or Cypher, you are to make a Point under
in the Dividend, to ſignify that ſuch a Figure or Cypher
ath been brought down and done with, as may be obſerved
the foregoing Example.

Though this Way of Working is plain, and eaſy to be
nderſtood, yet it is ſomewhat tedious; and therefore I
ew a quicker Way for Diſpatch, when the Diviſor is a
                            single

single Figure ; as shall be made confpicuous in thefe Exam-
ples following, *viz.*

	I.	II.	III.
	4) 78906	5) 34567	6) 29702
Quotient	19726 (2)	6913 (2)	4950 (
	4	5	6
Proof	78906	34567	29702

In the firft of thefe Examples I fay, the 4's in 7 once,
and there remains 3 ; which makes 8, the next Figure in the
Dividend 38 ; then the 4's in 38, 9 times ; 9 times 4 is 36,
from 38, and there remains 2 ; which makes 9, the next
Figure in the Dividend, 29 ; then the 4's in 29, 7 times;
7 times 4 is 28 from 29, and there refts 1 ; which makes 10,
the next of the Dividend, 10 , and the 4's in 10 twice;
twice 4 is 8 from 10, and there remains 2 ; which makes 6,
the laft of the Dividend, 26 ; laftly, the 4's in 26, 6 times;
and 6 times 4 is 24, from 26, and there refts 2 the Remain-
der : And fo for the other two Examples. And for Proof
of the Work, (or of any other Example) multiply the Quo-
tient by the Divifor, and take in the Remainder in the firft
Place, or Place of Units ; and if the Product be the fame
with the Dividend, the Divifion is right : For I fay, 4 times
6 is 24, and 2 the Remainder makes 26 ; 6 and go 2, *&c.*

More Examples by a fingle Figure.

	3) 54321	7) 279060	9) 234567
Quotient	18107 (0)	39865 (5)	26063 (0)
Proof	54321	279060	234567

This is the fhorteft Way of Divifion that can be by a
fingle Figure.

As it is neceffary for Expedition to multiply by 11 and
12, as by a fingle Eigure to have the Product in one Line ;
fo divide as in thefe Examples, *viz.*

11) 72646206   12) 76677240

Quotient   6604200 (6)   6389770
           11   12

Proof   72646206   76677240

11) 47627000   12) 42007400

Quotient   4329727 (3)   3500616 (8)
           11   12

Proof   47627000   42007400

In the firſt of theſe Examples, I ſay, the 11's in 72, Anſwer 6 times, &c. In the ſecond, I ſay, the 12's in 76, Anſwer 6 times, &c. In the third, the 11's in 47, 4 times ; 4 times 11 is 44, from 47, and there reſts 3, &c. In the fourth, I ſay, the 12's in 42, 3 times ; 3 times 12 is 36, from 42, and there remains 6, &c.

By being ready and dextrous in the Examples above, you may expeditiouſly divide by theſe Numbers, *viz.* 110, 120, 1100, or 1200, &c. for 'tis but cutting off, or ſeparating the Cyphers from 11 and 12, (when theſe Numbers happen to be Diviſors) and cutting off and ſeparating the like Numbers of Figures or Cyphers from the Right-hand of the Dividend, and then divide the other Figures or Cyphers towards the Left-hand, by 11 or 12, as it ſhall happen ; as in the Examples following, *viz.*

Divide 34567 by 110, and 890123 by 120, and 98765 by 1100, and 678901 by 1200.

11,0) 3456,7   12|0) 89012|3

Quotient $314\frac{2}{11}$ or $\frac{27}{110}$ $7417\frac{8}{11}$ or $\frac{83}{120}$

11,00) 987,65   12|00) 6789|01

Quotient $89\frac{8}{11}$ or $\frac{865}{1100}$ $565\frac{9}{12}$ or $\frac{901}{1200}$

When you divide by 10, 100, 1000, or 10000, &c. you have nothing more to do than to cut off, or to ſeparate ſo many Figures or Cyphers of the Dividend towards the Right-hand, as you have Cyphers in the Diviſor, and thoſe
                                      Figures

Figures towards the Left make your Quotient; and thole
cut off towards the Right, is the Remainder.

Examples.

Divide 123456789 by 10, 100, 1000, or 10000.
By 10 the Quotient is 12345678, and the Remainder 9.
By 100 the Quotient is 1234567, and Remainder 89.
By 1000 the Quotient is 123456, and Remainder 789.
By 10000 the Quotient is 12345, and Remainder 6789.

When the Divisor consisteth of several Figures, then there
ariseth a little more Difficulty in the Work, but if the fol-
lowing Directions are heedfully attended to, the seeming
Difficulty is easily overcome; as in the succeeding Example,
viz.

Suppose I am to divide 78901 Pounds among 32 Parishes;
or suppose an Assessment of so much Money was laid on so
many Parishes; what must each Parish pay by an equal Pro-
portion towards the raising such a Supply?

Divisor 32) 78901 (. . . . Quotient.

The Example thus set out, I begin at the Left-hand,
seeking how often I can take 32 out of 78; or more ea-
how many times 3 there is in 7, and the Answer is two
times; which I place in the Quotient thus, 32) 78901 (2
and then according to the *General Rule of Working*, I mul-
tiply the Divisor 32, by the two Placed in the Quotient,
saying, twice 2 is 4, and twice 3 is 6; so there is 64 to be
taken out of 78, and stands thus :

$$32) 78901 (2$$
$$64 \cdot$$
_____

14

Then I make a Point under 9, the third Figure of the
Dividend, and bring it down to the Remainder 14, and then
the Work appears thus :

$$32) 78901 (24$$
$$64 \cdot$$
_____

149

Then I seek again, asking how many times 32 in 149,
which is not readily to be answer'd; but how many times
3, the first Figure of the Divisor, is there in 14, the two first
Figures of the Dividual 149, and the Answer is 4 times;
wherefore, after placing 4 in the Quotient, I multiply, (as di-
rected

...ed in the *General Rule*) the Divifor 32 by the faid 4, ...ing, 4 times 2 is 8, placing it under 9 in the Dividual; ...en 4 times 3 is 12, and fet down under 14; fo there is 128 ...be taken out of 149, and then the Work appears thus:

```
32) 78901 (24
    64 · ·
    ———
    149
    128
    ———
    210
```

And after Subtraction there remains 21; then I make a Point under 0 in the Dividend, and bring it down to the Right of the Remainder 21, and then there is 210 for a New Dividual; then, as the General Rule directs, I feek again, faying, how many times 32, the Divifor, ...here in 210, the Dividual; or eafier, how many times 3 ...21? (☞ For obferve well, That whenever you have a ...ce more in the Dividual than in the Divifor, then always ...k how oft you can take the firft Figure of the Divifor ...t of the two firft of the Dividual) and the Anfwer is 7 ...es; but it will not bear 7 times, for 7 times 32 is 224, ...l you cannot take 224 out of 210; or rather, you cannot ...e 22 out of 21, wherefore try in your Mind before you ...down the Anfwer, or Figure in the Quotient, whether it ...l go to the Number of Times as is moft eafily fuggefted; ...here the Queftion or Demand is readily anfwered 7 ...es; and fo many times 3 may be taken in 21; but ...en you come to multiply the whole Divifor by the times ...a place in the Quotient, you begin at the Right-hand, ...d go towards the Left, carrying the Tens that arife to the ...xt Place, which increafes the Product fo, that fometimes ...btraction cannot be made, becaufe the under Line is ...eater than the upper, or that which you fhould fubtract ...m; wherefore firft try in your Mind as abovefaid; and ...ce it will not bear 7 times, try if it will go 6 times; fay-...g, 6 times 2 is 12; 2 and carry 1, and 6 times 3 is 18, ...d 1 is 19; and 19 may be taken out of 21, therefore fet ...wn 6 in the Quotient next to the 4, and multiply the Di-...for 32 by it, and the Work will ftand thus:

```
32) 78901 (246
    64 · · ·
    149
    128
    ———
    210
    192
    ———
    181
```

Here the Divifor 32 multiplied by 6, gives 192 to be taken out of 210, and the Remainder is 18; to which, after a Point made under it, I bring down the 1, the laft Figure of the Dividend, and then there is 181 for a new Dividual; then according to the Rule, I feek a-gain (for you are to note, That the

F   afore-

aforesaid *General Rule for working* muſt be as often repeated as you bring down a Figure or Cypher from the Dividend, to make a new Dividual; and alſo, that for every Figure or Cypher brought down, there muſt likewiſe be a Figure or Cypher placed in the Quotient) how many times 32 the Diviſor may be taken out of 181 the Dividual; or how many times 3 in 18, and the ready Anſwer is 6 times; but on the Tryal I find it will not go 6 times, wherefore I try a time leſs by 1, *viz.* 5 times, and find it will bear it; and ſetting 5 in the Quotient next to the 6, I multiply the Diviſor 32 by it, and it produces 160; which ſubtracted from 181, the laſt Remainder is 21, and the Quotient or Anſwer is 2465; and ſhews that 32 is contained in 78901, 2465 times; and 21 over, as *per* Work.

$$32) 78901 (2465$$
$$\underline{64\cdots}$$
$$149$$
$$\underline{128}$$
$$210$$
$$\underline{192}$$
$$181$$
$$\underline{160}$$
$$(21)$$

Again, admit a Nobleman hath 30000 *l. per Annum*, what is his daily Income?

If you divide 30000 by 365 (the Days in a Year) the Quotient will be the Anſwer. Set it down for working thus

$$365) 30000 ($$

Firſt, ſeek how many times 365 can be taken in 300 (an equal Number of Places with the Diviſor) anſwer times; wherefore I go a Place farther to the Right-hand, in the Dividend (for o muſt never begin the Quotient, as was ſaid before) and make a Point under it, *viz.* under the o but one, as may be ſeen in the Example; and there being a Place more in this pointed out Dividual than in the Diviſor, I ſeek how oft the firſt Figure of the Diviſor, *viz.* is contained in the two firſt Figures or Places of the Dividend, *viz.* 30, and the Anſwer is 10 times; but you are never to take above 9 times at once, in any of theſe Examples of Diviſion, wherefore try in your Mind whether it will bear 9 times, before you ſet it down in the Quotient (as was ſaid before) ſaying to your ſelf, or in your Mind, times 5 is 45; 5 and go 4; 9 times 6 is 54, and 4 is 58; 8 and go 5; and 9 times 3 is 2, and 5 is 32; now 32 cannot be taken out of 30, wherefore take a time leſs a Unit or One, *viz.* 8 times; and finding it will go 8 times ſet 8 in the Quotient; and then ſay, 8 times 5 is 40; 0 and carry 4; and 8 times 6 is 48, and 4 is 52; 2 and carry 5;

d 8 times 3 is 24, and 5 is 29; and then there is 2920 to
taken from 3000; and after Subtraction, the Work ap-
ars thus:

$$365) 3000 (8$$
$$2920$$
$$\overline{\quad\quad}$$
$$80$$

hen to the Remainder 80, I bring down 0, the laſt of the
ividend, and then there is 800 for a new Dividual; then
ou muſt try how oft you can take 365 out of the ſaid Di-
idual 800, and the Number of Places being equal to both
Diviſor and Dividual, to wit, 3, aſk how oft 3 in 8;
ſwer twice; ſo put 2 in the Quotient, and ſay, twice 5 is
; 0 and carry 1; and twice 6 is 12, and 1 is 13; 3
d carry 1; and twice 3 is 6, and 1 is 7; ſo there is 730
be deducted from 800, and the Remainder is 70, as in the
ole Work may be ſeen, *viz.*

365) 30000 (82   Thus by the Work the Noble-
2920·   man hath Eighty-two Pounds *per*
‾‾‾‾‾   *Diem,* and 70 Pounds over; which
800   it multiplied by 20, the Shillings in
730   a Pound, would produce 1400 Shil-
‾‾‾‾‾   lings; which if divided *per* ſaid
(70)   Diviſor 365, there would come out
a Day more, and there will be a Remainder of 305,
ich multiplied by 12, the Pence in a Shilling, produces
60; which divided ſtill *per* 365, gives 10 Pence a Day
re: So that 30000 *l.* a Year is *l.* 82--3--10 a Day.
Once more, Divide 46242 Gallons of Canary by 252,
Gallons in a Tun, thus ſet down:

252) 46242 (183   In this Example, after Enquiry,
252··   I find that it will not go twice,
‾‾‾‾‾   therefore I ſet down 1 in the Quo-
2104   tient, and place 252 under 462 of
2016   the Dividend, and after Subtrac-
‾‾‾‾‾   tion the Remainder is 210; to
882   which I bring down 4 from the
756   Dividend, and the Dividual is
‾‾‾‾‾   2104; and then ſeeking again, find
(126)   it will bear 8 times; which placed
the Quotient, and the Diviſor 252 multiplied by
F 2   it,

it, the Product is 2016 to be subtracted from 2104; which
being done, the Remainder is 88; to which 2, the last Fi-
gure of the Dividend, being brought down, there is 882
for the last Dividual; and then seeking again, I find it
will go 3 times; and the Product of the Divisor multiplied
by 3, is 756; which subtracted from 882, there remains
126 for the last, or true Remainder: So that by this Di-
vision, I find there are 183 Tuns in 46242 Gallons, and
126 Gallons remaining, or over and above; which being
half of 252 the Divisor, the Remainder is therefore half a
Tun more.

When you have a Cypher or Cyphers in the Divisor, in
the First, Second, or Third Place, &c. separate such Cy-
pher or Cyphers, with a Dash of the Pen, from the rest of
the Divisor; and also cut off as many Figures or Cyphers
from the Right of the Dividend, as you cut off Cyphers
from the Divisor, and divide the remaining Figures towards
the Left-hand by the remaining significant Figures of the
Divisor.

Example.

Divide 47952 Square Poles of Land by 160, the Square
Poles in an Acre of Land.

```
16,0) 4295|2 (268
      32··
      ───
      109
       96
      ───
      135
      128
      ───
      (7)
```

Here the Cypher is cut
off from the Divisor, and
2 from the Dividend; then
I ask how oft 16 in 42,
answer twice; then the 16's
in 109, answer 6 times;
then the 16's in 135, an-
swer 8 times. So there are
268 Acres, and 7 remain,
that is 268 Acres, $\frac{7}{16}$ or $\frac{7}{16}$,
or almost half an Acre.

Divide 27|00) 62746|20 (2323 $\frac{25}{27}$ or $\frac{2500}{2700}$.

```
      54··
      ──
      87
      81
      ──
      64
      54
      ──
      106
       81
      ──
      (25)
```

In this Example, two Cy-
phers are separated from the
Divisor, and also two Places
from the Dividend, and then
62746 is divided only by 27.
See the Work.

When the Divifor is 3, 4, 5, 6, or more Figures, there a fure and eafy Way of performing the Work truly, by aking a Table of the Divifor; which may be done by *Addition*, or by multiplying the Divifor by 2, 3, 4, &c. dmit you are to divide 987654321 by 123456.

		Times	
123456) 987654321 (8000			
987648 ···		1	123456
(6321)		2	246912
Here having noted the		3	370368
umber of Figures in the			
Divifor, which here is 6,		4	493824
make a Point under the			
xth Figure, or Place of		5	617280
e Dividend, &c.			
		6	740736
		7	864192
		8	987648
		9	1111104

The foregoing Table is made by doubling the firft Line, ich is 246912; which added to the firft or uppermoft ne, gives the 3d Line 370368; which alfo added to the d firft Line, makes 493824 for the 4th Line or Product; d fo of the reft; ftill remembring to add the fubfequent ne or Product to the firft or uppermoft Line, till you me to the laft Line of 9 times, which is 1111104; the uth of which may be proved by multiplying the firft uppermoft Line by 2, 3, 4, 5, &c. and if you commit Error by *Addition*, it may be found or corrected by *ultiplication.*

The Ufe of the faid Table.

When you have pointed out your Number of Places in Dividend, caft your Eye on the Table, and at the firft w you may know how many times you can take; as this Example, 7 times is too little, and 9 times too ch; wherefore I fet down 8 in the Quotient, and then ltiply and fubtract, and the Remainder is 6; to which

F 3   I

I bring down 3, and put o in the Quotient ; then to the
63, I bring down 2, and place o in the Quotient ; then to
632 I bring down 1, the laſt Figure of the Dividend ; but
ſtill it will not bear any Times or Time, wherefore I put
another o in the Quotient ; and ſo the Work is done, and
the Quotient is 8000, and the Remainder 6321 ; as in the
Work.

Thus having plainly, fully, and pertinently ſhewn, by
verbal Directions, the Method of Working Diviſion; I
think it unneceſſary to give any more Examples in that
Manner, but ſhall leave ſome few Examples for Practice
ſake, whoſe Quotients and Remainders are expreſſed, but the
Operation omitted, to ſave Room, and for Trial of the In-
genuity of Practitioners.

7400690042 divided by 987, the Quotient is 7498166, and
  Remainder 200.

479679002742 divided by 4689, the Quotient is 102298704,
  and Remainder 4566.

7969767002 divided by 976294, the Quotient is 8163,
  and Remainder is 279080.

456789012345 divided by 9876543, the Quotient is
  46249, and Remainder 8775138.

764697 by 4500, Quotes 16993, and Remainder 1249. And
8092320000 by 345000, Quotes 23456, and remains (0).

The Proof of Multiplication and Division.

THeſe two Rules reciprocally prove each other ; for
in proving *Multiplication,* if you divide the Product
by the Multiplier, the Quotient will be like the Multipli-
cand ; or if the Multiplicand, the Quotient will be the ſame
with the Multiplier.

Exa. 1.   345
             24
          ───────
           1380
            690
       24) 8280 (345
            72··
          ───────
            108
             96
          ───────
            120
            120
          ───────
            (0)

Ex. 2.   Or thus,

         345) 8280 (24
                690·
             ───────
                1380
                1380
             ───────
                (0)

To prove Division.

Division may be proved by Division, thus :

If you divide the Dividend by the Quotient, the Quotient will be your former Divisor.

Example.

Divide 8280 by 345,

345) 8280 (24

Here the Working again is needless, it being in the Page foregoing ; and shews the Truth of the Assertion, that *Division* may be proved by *Division*, as aforesaid.

But the most usual Way of proving *Division* is by *Multiplication* in this manner, *viz.* multiply the Quotient by the Divisor, and the Product will be equal to the Dividend, Example of 1. in the foregoing Page.

354 *Quotient*
24 *Divisor*

1380
680

8280 *Proof*

Note, That when there is any Remainder, such Remainder must be taken in or added to the Product.

As in *Multiplication*, I gave some Examples of its Utility in Money, so likewise I shall give a few Examples in *Division of Money* ; whereby may be seen how expeditiously some Things may be done, without having Recourse to Reduction, the Rule of Three, &c. *viz.*

Example 1.

Divide 26 *l.* 12 *s.* 6 *d.* equally among Five Men : For Disposition of working, set it down as follows.

l.   s.   d.

5) 26—12—6

5—06—6
        5

Proof 26—12—6

In the working of this, I say, the 5's in 26, 5 times ; 5 times 5 is 25, from 26, and there remains 1, or 1 Pound, or 20 Shillings ; which with the 12 s. in the Place of Shillings, makes 32 *s*; then the 5's in 32, 6 times ; 6 times 5 is 30, from 32, and there remains 2 s. or 24 *d.* which with the 6 *d.* in the Place of Pence, makes 30 ; then the 5's in 30, 6 times ; and so the Work is done, and the Answer is, that each Man must

have *l.* 5—06—6 for his equal Share in the faid Divifion of *l.* 26—12—6 amongft 5 Perfons; and the Truth of it is proved by Multiplication of Money, fufficiently fhewn in the Rule of Multiplication; as here, 5 times 6 is 30; and carry 2; and 5 times 6 is 30, and 2 is 32; 12 and carry 1; and 5 times 5 is 25, and 1 is 26, *&c.*

Example 2.

Divide the Charges of a Country Feaft, amounting to *l.* 246—13—4 equally amongft 12 Stewards, to know what each Steward muft pay.

```
   l.    s.   d.
12) 246—13—4
Anfwer 20—11—1 1/12
```

'Here I fay, the 12's in 24 twice, and the 12's in 6, 0 times, and there remains 6 *l.* or 120 *s.* and 13 *s.* make 133; and then the 12's in 13 once, and there remains 1 *s.* or 12 *d.* then 12 and 4 is 16; and the 12's in 16 once, and 4 remains; fo that each Steward muft pay *l.* 20—11—1 4/12 or four twelfths of a Penny, fomething more than a Farthing; and this may be proved as that above.

When any Quantity is fuch a Number that any two Digits of the *Multiplication-Table*, multiplied together, make the faid Quantity or Number, then the Quotient may be very expeditioufly found at two Divifions, and fooner than at one. *Example:* Divide 7872 by 32. In this Example, the Digits, component Parts, or Ratio's, which multiply'd together, make the Divifor 32, and 4 and 8, or 8 and 4; for it matters not which of the Ratio's you divide by firft; for either of which Divifions give a true, and the fame Quotient; as may be feen by the different Methods of the following Work.

```
4) 7872              Or thus, 8) 7872

8) 1968                       4)  984

   246 Quotient                   246 Quotient.
```

Here though the Operations are divers, yet the *Quotients* are one and the fame. Again, divide 44184 by 56.

Example

Example 2.

7) 44184

8)   6312

789 *Quotient.*

Here the *Divisors* are 7 and 8, or 8 and 7 ; for either, or both, will give the same *Quotient.*

And thus may above Forty Examples be wrought by Numbers out of the *Multiplication-Table*, with great Dispatch and Expedition, as by 15, 18, 25, 35, 64, 72, 96, &c.

When it happens there is any Remainder in the first Division, or the last, or in both ; to know the true Remainder as if you divided by the common Way, take this Method, *viz.* multiply the first Divisor by the last Remainder and to it take in or add the first Remainder, if there be any, and the Product will be the true or same Remainder as if you divided by the long Way. *Example*; Divide 4567 by 15.

3) 4567

5) 1522—1

304—2

(7)

Here I multiply 3, the first Divisor by 2, the last Remainder, and take in 1, the first Remainder, and it makes 7 for the true Remainder, as may be proved at leisure, by the other Way.

The same Observation and Method must be taken with respect to component Parts mentioned before, in Division of Money, as in Division of Simple Numbers.

Example.

	l.	*s.*	*d.*	
3)				
Divide	463—18—06			into 13 equal Parts.

6) 154—10—10

Answer   25—15—01$\frac{4}{8}$

By this Method of *Division of Money* (if the Quantity be as aforesaid made by even component Parts) you may, by having the Price of several Things, know the Price or Va-

F 5   lue

lue of one Thing, at the said Rate, as well as by the *Rule of Three*: So doth *Multiplication of Money* answer Questions in the *Rule of Three*, when the first Number is a Unit or One.

Example by Division.

If 84 *lb.* of Coffee cost

$$7) \quad l. \quad s. \quad d.$$
$$31 - 10 - 0 \quad \text{what is that a } lb?$$

$$12) \; 4 - 10 - 0$$

Answer 0 — 07 — 6 *a Pound.*

As in the Multiplication of Money, to have an Answer you multiply the Price by the Quantity ; so in Division of Money, you divide the Price by the Quantity, to have your Answer.

I could speak more largely, if I had Room, of the excellent Uses that may be made of *Multiplication* and *Division* only ; but their various Uses will be better understood by their Application in the following Rules of *Arithmetick*, particularly in the next Rule, call'd,

REDUCTION;

WHICH is an Application of *Multiplication* and *Division*, shewing how to reduce Numbers of one Denomination to another, thereby discovering the same Value, tho' in different Terms.

1. As first, All Great Names are brought into Smaller by Multiplication, as Pounds into Shillings, Pence, or Farthings, by multiplying 20, 12, and 4. Or Hundreds Weight into Pounds Weight, by multiplying by 4 and by 28, or by 112 ; or lower, into Ounces or Drams, by multiplying by 16 and 16.

2. And on the contrary, All Small Names are brought into Greater by Division ; as Farthings into Pounds, by dividing by 4, 12, and 20 ; and Pounds Weight into Hundreds Weight, by dividing by 28 and 4 ; and Drams into Pounds, by dividing by 16 and 16.

But you may Note, That Pounds only are brought into Pence, by multiplying by 240 ; or into Farthings, by multiplying by 960 ; and just the contrary by Division.

And for Weight, as expressed above.

The Sense, Meaning, and Use of *Reduction*, is expressed in the following Verses,

Reduction shews how we of Names in Use,
May Great to Small, or Small to Great, reduce;
So that the Answer which shall thence arise,
The given Sum in Value equalize;
Multiply, or divide it, back you must;
Which makes again your given Number just.

Example 1.

In 240 *l.* Sterling how many Pence?
    20 Shillings 1 Pound.

		Or thus,
4800 Shillings in 240 *l.*		240 *l.*
12 Pence 1 Shilling		240 *d.* in a *l.*
Answ. 57600 Pence in 240 *l.*		9600
		480
		Answer 57600

Example 2.

In 226 Tuns of Copper how many Pounds Wt?
    20 C. 1 Tun.

		Or thus,
4520 Hund. Wt. in 226 Tuns		226 Tuns
4 qrs. 1 C.		20
18080 qrs. of a C. Wt. in 226 Tuns	4520
28 lb. 1 qr. of a C.		112
144640		54240
36160		4520
506240 Pounds Wt. in 226 Tuns		506240 Pounds.

These foregoing Examples are Great Names to be brought into Small (as may easily be observed and understood;) therefore, as the first Rule directeth, it is done by Multiplication, by multiplying the greater Name by the Number of the next lesser Name that makes one of the said greater; as in the last Examples the lesser Name to Pounds is Shillings

lings ; wherefore I multiply by 20, because 20 of that lesser Name makes one of the said greater Name, *i. e.* 20 Shillings make a Pound. And the same regard is had, and Method observed, in the Example of Weight ; as is very plain to be seen in the Work, and is called *Reduction Descending*, because it brings Higher or Greater Denominations into Lower or Lesser.

<center>*Example* 3.</center>

Bring 494400 Farthings into Pounds.

Or thus :

4)

12) 123600 Pence.   96|0) 49440|0 (515 *l.*
                                           480 · ·
2|0 1030|0 Shillings.   ————   In this Way
                                           144   I divide by
      515   Pounds.   96   960 the
                                          ————   Farthings
                                           480   in a Pound
                                           480   &c.
                                          ————
                                           (0)

In the first Way, I divide the Farthings by 4, because 4 of them make a Penny, and the Quotient is Pence ; then these Pence I divide by 12, because 12 of them make a Shilling, and that Quotient is Shillings ; which Shillings I divide by 20, to bring it into Pounds, thus ; I cut off the Cypher in the Dividend towards the Right, for the Cypher that is in the Divisor 20, which is also separated from it with a Dash of the Pen (as may be seen in the Work ;) then I halve the Figures one by one, as they are united with the Remainder in the Dividend ; which half is Pounds, and is a short Way of dividing by 20: In the Example I say, the half of 10 (because I must not set down 0 at the Beginning) is 5, and the half of 3 is 1, and there remains 1 ; which makes the next, which is 0, 10 ; and the half of 10 is 5 : So that 10300 Shillings makes 515 Pounds, or there are so many Pounds in 494400 Farthings.

Note, In dividing by 20, as above, if any thing remains, it must be joined or annexed to the Figure or Cypher cut off ; as suppose there had in halving the last Figure (excepting what you cut off) remained 1 ; which there doth never more, and then neither, but when the Figure

<center>halveth</center>

alveth odd ; I fay, if there had remained 1, then it muft
have been joined to the Cypher feparated or cut off, and
then there would have been 10 Shillings.

<div align="center">*Example 4.*</div>

Reduce 27552 Pounds Weight into Hundreds Wt:

```
        4)
28) 27552 (984            Or thus,
    252··                     I.
    ------   246 C. wt. Anfwer.   112)27552 (246 Anf.
    235                       224··
    224                       -----
                               515
    112                       448
    112                       -----
    ------                     672
    (0)                        672
```

In the firft of the two foregoing Examples I divide the
Pounds by 28 to bring them into Quarters ; then I divide
thofe Quarters by 4, to bring them into Hundreds Weight,
as in the Work.

In the fecond Way, I divide the Pounds Weight by
112, the Pounds in a C. Weight, and it brings the Pounds
Weight into Hundreds Weight at once.

The faid Examples are of Small Denominations to be
brought into Greater; and therefore according to the fe-
cond Rule of Direction, it is done by Divifion, by dividing
the leffer Name by as many of them as make the next
greater Name ; that is by 28, becaufe 28 of them make
one of the next greater Name, *viz.* a Quarter of a Hun-
dred ; and this Reduction is called *Reduction Afcending,*
becaufe it brings low or fmall Names to higher or greater
Denominations.————By which may be obferved, That all
Queftions in Reduction, whether Afcending or Defcending,
are anfwered either by Multiplication or Divifion, or by
both ; as will plainly appear in the fundry Examples of
Reducing of divers Denominations to others.

When it is required to reduce Numbers of feveral Deno-
minations by *Reduction Defcending,* or by *Multiplication,*
you are to work as before ; but you muft always remember
to take in fuch Numbers as ftand in the Place of the next
<div align="right">inferior</div>

inferior Denomination; as when you multiply the Pounds by 20, if there be any Shillings in the Denomination or Place of Shillings, you muſt take them in: So likewiſe when you multiply the Shillings by 12, if there be any Pence in the Place of Pence, you muſt alſo take them in: And ſo when you multiply the Pence by 4, to bring them into Farthings, you muſt take in the Farthings, if there be any, in the Place of Farthings, as in the following Work.

Example 5.

l.   s.   d.

In 346—16—9 ½ how many Farthings?
    20 Shillings 1 Pound.

6936 Shillings in 346 *l.* 16 *s.*
  12 Pence 1 Shilling.

83241 Pence in 346 *l.* 16 *s.* 9 *d.*
    4 Farthings 1 Penny.

332966 Farthings in 346 *l.* 16 *s.* 9 *d.* ½.

The Example is ſo plain in the Work, that it hardly needs any Explication; but I begin to ſay 0 is 0, but 6 in the Units of Shillings is 6; then twice 6 is 12; and 1 in the Tens of Shillings is 13; 3 and carry 1; and twice 4 is 8, and 1 is 9; and twice 3 is 6; then by 12, ſaying 12 times 6 is 72, and 9 *d.* (in the Place of Pence) is 81; 1 and carry 8; and 12 times 3 is 36, and 8 is 44; and 4 and carry 4; and 12 times 2 is 108, and 4 is 112; 2 and carry 11; and 12 times 6 is 72, and 11 is 83, &c.

Example 6.

C.   qrs.   lb.

In 56—2—16 of Tobacco, how many Pounds Weight?
    4 qrs. 1 C.

226 qrs. in 56 C. 2 qrs.
  28 lb. 1 qr. of a C.

1814
 453

Anſ. 6344 Pounds Weight in 56 *C.* 2 *qrs.* 16 *lb.*

In the foregoing Work, I first multiply the 56 *C.* by 4, and take in the two Quarters; and then I multiply the 226 *lbs.* by 28, saying, 8 times 6 is 48, and 6 (the Unit Figure of the odd Pounds) is 54; 4, and carry 5, &c. Then I multiply by 2, saying, twice 6 is 12, and 1 (that stands in the Place of Tens in the odd Pounds) is 13; 3, and carry 1, &c. Then adding the two Products together, they make 6344 Pounds, contained in 56 *C.* 2 *qrs.* 16 *lb.* as in the Work is conspicuous. Or, the Example may be sooner done by multiplying the 56 *C.* by 112, the Pounds in a C. Wt. and taking in the odd Weight, *viz.* 2 *qrs.* 16 *lb.* or 72 Pounds at once, thus:

```
C.
56
112
———
 672
56,72 odd Weight.
———
6344
```

I say here, 12 times 6 is 72; 2 and carry 7; and 12 times 5 is 60, and 7 is 67; then once 6 is 6, setting it down in the third Place, because by multiplying by 12 at once, two Places are taken up: See the Work.

Or, still briefer thus, by setting down the 56 **C.** four several times, in the following manner; taking in the odd Weight, as before.

```
56 C.
56
56
56,72
```

The same as above, *viz.* 6344 Pounds.

Reduction Ascending,

Is the bringing Numbers from a lesser denomination to a greater, and is the Reverse of *Reduction Descending*; and each may serve as a Proof to the other, one being performed by *Multiplication*, and the other by *Division.*

And note, That when at any Time in *Reduction Descending* you take in, or add to, the odd Money, Weight, or Measure, as you multiply the several Denominations, such Quantities will be Remainders in *Reduction Ascending.*

Example

Example by the two foregoing Sums.

4)
In 332966 Farthings, how many Pounds?
12) 83241 — ½ d. remains what taken in.
2,0) 693,6 — 9 d. remains what taken in.
       346 — 16 s. remains what taken in.

So that in 332966 Farthings there are 346 *l*. 16 *s*. 9 d.½
and is a sure Proof of the foregoing Work descending.

Again, in 6344 Pounds Weight, how many Hundred
Weight?

$$\begin{array}{r} 4 \\ 28)\,6344\,(226\ qrs. \\ 56\cdots \overline{} \\ \hline 74 \qquad 56\ C.\ 2\ qrs.\ \text{taken in.} \\ 56 \\ \hline 184 \\ 168 \\ \hline (16)\ \text{remain Pounds taken in.} \end{array}$$

So that in 6344 Pounds Weight, there is 56 *C.* 2 *qrs.* 16 *lb.*
and proves the foregoing Example descending to be right.

Now follow promiscuous Examples of both Kinds of Reduction, one proving the other.

In 276 *l*. 12 *s*. how many Pence?

$$\begin{array}{rl} 20 & \qquad 12 \\ \overline{5532} & \text{In 66384 } d. \text{ how many Pounds?} \\ 12 & 2|0)553|2 \\ \end{array}$$

Anf. 66384 Pence. *Anf. l.* 276|12 and *Proof.*

In 47964 Grains, how many Pounds *Troy?*

$$\begin{array}{r} 20 \\ 24)\,47964\quad(199|8 \\ 24\cdots \quad 12)\,99\text{—}18\ \text{Pwts.} \\ 239 \qquad \text{In 8 } lb.\ 3\ oz.\ 18\ pwt.\ 12\ gr.\ \textit{Anfwer how ma-} \\ 216 \qquad\qquad\qquad\qquad\qquad \textit{ny Grains} \\ 236 \qquad 12 \\ 216 \qquad \overline{99} \\ 204 \qquad 20 \\ 192 \qquad \overline{1998} \\ Gr.\ (12) \quad 24 \\ \overline{7924} \\ 3997 \\ \textit{Anfwer}\ \overline{47964}\ \text{and } \textit{Proof.} \end{array}$$

In 34 C. ¾ of Cotton Wool, how many Pounds ?

```
    34                    112)3892 (34 C. ¾ Proof.
    34                    336·
  34184                   ———
    ——                    532
 3892 Pounds.            448
  ——
                         (84) lb. or ¾ of a C.
```

In 456 C. 3 qrs. 27 lb. of Copper, how many Pounds ?
and what comes it to, at 21 d. per lb. ?

```
   456 C.
   456                    Or thus,
   456                      C.
   456                     456
   ,1·1                    112
   ————                    ———
  51183 Pounds.           5472
  21 d. per lb.           456
  ————                    ,111
  51183                   ————
 10366                   51183 Pounds.
```

154843 Pence ; which bring into Pounds by *Division*, or
Reduction Afcending, as before fhewn, and it will
amount to *l.* 645 : 3 : 7.

Bring 4796 Ells *Flemifh* into Ells *Englifh* ; multiply by 3,
3   and divide by 5, becaufe 3 Quarters make
——   an Ell *Flemifh*, and 5 an Ell *Englifh*.
5)14388

2877 ⅗

Reduce 456 Ells *Englifh* into Yards ; multiply by 5, and
divide by 4, thus :

456 *Englifh* Ells.
5 qrs. 1 *Eng.* Ell.   In 570 Yds how many *Eng.* Ells ?
                       4 qrs. 1 Yd.
2280 qrs.   ————
                       5) 2280
570 *Anfwer*   ————
                 Englifh Ells 456 *Anfwer* and *Proof.*

                                              Bring

Bring 130 Tuns of Wine into Gallons.

4 Hogsheads 1 Tun.

		Or thus,
520		252 Gallons 1 Tun
	63 Gallons 1 Hogshead.	130 Tuns.
1560		7560
3120		252

Anf. 32760 Gallons.   32760

And so the contrary by *Division.*

Lasts.   Quarters.   Bushels.   Pecks.
Reduce 42 ——— 3 ——— 5 ——— 2 into Pecks.

10 qrs. 1 Last.

423 qrs.   Here I multiply by 10, and
  8 Bushels 1 qr.   take in 3 *qrs.* and then by
                              and take in 5 *Bushels*; and
3389   lastly, by 4, and take in 2
  4 Pecks 1 Bushel.   *Pecks.*

13558 Pecks, in 42 Lasts, 3 Quarters, 5 Bushels, and
                              2 Pecks.

4)
In 13558 Pecks, how many Lasts, &c.

8) 3389 2 Pecks taken in.

1|0) 42|3 5 Bushels taken in.

Lasts 42 3 Quarters taken in.
Answer, 42 Lasts, 3 Quarters, 5 Bushels, and 2 Pecks.

Thus by the two foregoing Examples it is seen, that *Re-duction Ascending* and *Descending* mutually prove each other, as was said before; and is no more, than that *Multiplication* and *Division* prove one another.

By *Reduction* also,

Foreign Coins or Exchanges may be reduced to Sterling Money; and on the contrary, Sterling Money to Foreign.

Exam-

Example.

Reduce 246 *Venetian Ducats de Banco* into Sterling Mo-
ney, the Exchange at 52 *d.* Sterling *per* Ducat, thus :

$$246$$
$$52$$

$$492$$
$$1230$$

$$12)12792$$

$$2|0)106|6$$

l. 53,6 To be paid in *London*,
for the 246 Ducats drawn in *Venice.*

Reduce 53 *l.* 6 *s.* Sterl. into Ducats at 52 *d.* Sterl. *per* Ducat.

$$20$$

$$1066$$
$$12$$

$$)12790(246$$ Ducats to be paid in *Venice* for the 53 *l.* 6 *s.*
$$104$$ drawn in *London.*

23, &c.

To reduce *Flemish* Money into *Sterling* Money, divide the
Pence *Flemish* by the Par of Exchange, *viz.* 33 *s.* 4 *d.* and
the Quotient will be the *Sterling* Money ; and what remains
multiply by 20, &c.

Example.

In 342 *l.* 13 *s.* 4 *d. Flemish*, how many
$$20$$ Pounds *Sterling*, &c. ?

13 *s.* 4 *d. Flemish.* $$4853$$
$$12$$

$$4|00)582|40$$

l. 145 *Sterling.*
Remains 240
$$20$$

$$4|00)48|00$$
12 Shillings *Sterling.*

By

By the Work it appears that 145 *l.* 12 *s.* Sterling, &
fwers or is equivalent to 242 *l.* 13 *s.* 4 *d.* *Flemiſh,* at 33
4 *d.* *Flemiſh, per* Pound *Sterling.*

Thus *Flemiſh* Money may be reduced to *Sterling* Mone
though the Par of Exchange be at any other Rate of Shi
lings and Pence *Flemiſh :* But when at the Rate, as abov
viz. 33 *s.* 4 *d.* (the common Par) then the Anſwer is ſoon
found by multiplying by 3, and dividing by 5 ; for 400
Flemiſh is the ſame to 240 *d.* *Sterling* (each being a Poun
as 3 is to 5 ; for if you divide 240 by 3, it quotes 80:
400 divided by 5, quotes the ſame.

The foregoing *Example* done by the laſt propoſed Way.

$$l. \quad 240-13-4 \; Flemiſh.$$
$$3$$

$$5) \overline{722-00-0}$$

$$l. \quad \overline{144-08-0} \; Sterling.$$

Note, French Money is reduced to *Sterling,* viz. *Liv*
Sols, and *Deniers* (or *French* Pence) as *Sterling* and *Flen*
Money is, by multiplying by 20 and by 12.

In 426 *French* Crowns, each 54 *d.* $\frac{1}{4}$ *Sterling,* how m
Pounds, *&c. Sterling* ?

426
54
———
1704
2130
106 $\frac{2}{4}$ or $\frac{1}{2}$ *d.*
———
12) 23110 : 10 *d.*
———
2|0) 192|5
———
Anſwer *l.* 96:5 : 10 $\frac{1}{2}$ *Ster.* the Work.

In this Example, the Nu
ber of Crowns is multipl
by 54 *d.* and for that I t
the 4th Part of 246, which
106 $\frac{2}{4}$ of a Penny, or a Ha
penny ; which added to t
other Pence, gives for To
23110 *d.* which divided
12, quotes 1295, and 10 *d.*
mains ; ſo the Anſwer is 9
5 *s.* 10 *d.* $\frac{1}{2}$ *Sterling :* As

Again, Bring 1600 Pieces of Eight *Mexico,* at 54
Sterling, into Pounds, *&c. Sterling* ?

16

```
    1600
  {  54
  ─────
    6400
    8000
     200
     200
  ─────────
12) 86800 Pence.
  ─────────
2|0) 723|3—4
  ─────────
l. 361 : 13 : 4
```

Here the 1600 Pieces of Eight are multiplied by 54, to bring them into Pence; and for the $\frac{2}{8}$ I take the $\frac{1}{8}$ of 1600 twice, &c. as in the Work. And the Answer is *l.* 361 : 13 : 4.

This Method is of Use in reducing the Exchanges of *Ca-dix, Leghorn,* and *Genoa.* Or when the Exchange is at so many Pence, and Eights of a Penny, (as often the Exchanges run) then multiply the given Number to reduce it to Pence, by the Pence contained in a Piece of Eight; and so multiply the said given Number apart, by the Numera-tor or upper Figure of the Fraction, and divide by the De-minator or under Figure of the Fraction, and the Quotient will be Pence; which add to the other Pence produced by multiplying the given Number by the Pence contained in one of the Pieces for Exchange; then divide the total Pence by 12, &c.

Example.

Bring 296 Dollars, at 52 d. $\frac{6}{8}$ *Sterling,* into Pounds, &c.

```
        296
         52
       ─────
        592
       1480
       ─────
       15392
        222
       ─────
    12) 15614
       ─────
    2|0) 130|1—2
```

```
   296 Dollars.
        6
      ─────
   8) 1776
      ─────
     222 Pence.
```

Answer *l.* 65 : 1 : 2 *Sterling* Money due for 296 Dol-lars, at 52 d. $\frac{6}{8}$ *Sterling per* Dol. But

But *Ducats, Dollars, Crowns, Millreas,* &c. are more expeditiously caft up by the Rules of Practice hereafter to be fhewn.

And fo much for *Reduction.* The next Rule in *Arithmetic* is

The GOLDEN RULE, *or* RULE OF THREE.

IT is called the *Golden Rule* from its excellent Performances in *Arithmetick,* as in other Parts alfo of *Mathematical* Learning.

And the *Rule of Three* becaufe from three Numbers given propofed, or known, we find out a fourth Number required, or unknown; which bears fuch Proportion to the third as the fecond doth to the firft Number. From whence alfo it is called *The Rule of Proportion.*

And of this *Proportion* there are two forts; one called *Direct;* and the other *Indirect,* or *Reverfe.*

Direct Proportion is, when the fecond and third Numbers are multiplied together, and their Product is divided by the firft.

Indirect, or *Reverfe Proportion* is, when the firft and fecond Numbers are multiplied together, and their Product is divided by the ~~firft.~~ *third.*

In *Direct Proportion,* the fourth Number, or Anfwer to the Queftion, contains the third Number as often (or as many times) as the fecond contains the firft.

But in *Indirect Proportion,* the greater the third Number is, the lefs is the fourth; and the leffer the third Number is, the greater is the fourth.

The Stating the Queftion,

The chiefeft Difficulty that occurs in the *Rule of Three,* is the right placing the Numbers, or ftating the Queftion: For when that is done, you have nothing more to do, but to multiply and divide, and the Work is done.

And to this End, we are to remember, that of the three given Numbers, two of them are always of one Name or Denomination; and the other Number is ever of the fame Name with the fourth Number or Anfwer required; and muft always be the fecond or middle Number: And the Number that afketh the Queftion, muft ftill poffefs the third or laft Place; and the other Number of the fame Name with the third, muft be the firft Number: For, the firft and third Numbers muft always be of one Name, *viz.* both Money both

h Weight, both Time, or both Meafure. And though
y be of one Kind, yet if one of them is altered, by
duction, from a high to a lower Name, then the other
ft be reduced to the fame Name. For you muft parti-
arly note, *That if either the firft or third Numbers confift
feveral Denominations, that is, of Pounds and Shillings ;
Pounds, Shillings, and Pence ; or of Pounds, Shillings,
ce, and Farthings ; or of Tuns, Hundreds, Quarters, and
nds,* &c. *then muft they be reduced to the loweft Name
tioned. And if one happen to be of divers Denominations,
l the other but of one Name ; then the Number of one Name
t be reduced as low, or into the fame Name with the
r : As fuppofe the firft Number is brought into Farthings,
the third Number, though but Pounds, muft be brought
Farthings alfo. Then you are to multiply the fecond and
d Numbers together, (when the Proportion is Direct) and
de the Product by the firft Number, and the Quotient thence
ing will be the Anfwer to the Queftion, and in the fame
ne with the Middle Number : And if in a fmall Denomi-
ion, it muft be brought by Divifion to the higheft Name, for
better underftanding the Anfwer.* You muft alfo note,
t *if the middle Number be of feveral Denominations, it
be brought into the loweft mentioned.*

Example 1.

f 12 Gallons of Brandy coft 4 *l.* 10 *s.* what will 134
ons coft at that Rate ?

Stated for working thus :

Gallons.		*l.*	*s.*		Gallons.
If 12	——	04	— 10	——	134
		20			90
		90		12)	12060
				2|0)100|5	
				l. 50|5 *Anfwer.*	

ere the firft and third Numbers are of like Names, *viz.*
Gallons ; and 134 being the Number that asketh the
tion, it hath the third Place, as it always muft, as be-
afferted ; and 4 *l.* 10 *s.* the fecond Number, being of
Denominations, *viz.* Pounds and Shillings, it is reduced
he loweft mentioned, *viz.* Shillings, as before directed,
and

2

and then the three Numbers are thefe, *viz.* 12—90—134,
and 134 the third Number, being multiplied by 90, the fecond
Number, produces 12060; which divided by 12, the firft
Number, quotes 1005 Shillings, the Name of the middle
Number 90; and 1005 Shillings, divided by 20, gives 50*l.*
5 *s.* for the Anfwer: And for the Proof of its Truth, ftate it
back again thus:

<div align="center">

Example 2.

Gal.   *l.*   *s.*   Gal.

If 134 coft 50 — 5 what 12?

20

————

1005

12

</div>

————

134) 12060 (90 *s. Anfwer*, or 4 *l.* 10
1206   the Coft of 12 Gallons, and
————   is a fure Proof of the firft
Work; and the back ftating and working the Proof, is as
much a Queftion in the Rule of Three as the firft.

By the foregoing Rules and Directions, and thefe two
Operations, you may underftand the Nature of the Rule, and
Method of working, and with Eafe and Certainty anfwer
any Example propofed in the Rule of Three direct: And
therefore, I fhall omit what I can of verbal Directions, and
abate as much of Figure Work as is confiftent with Difpatch,
and of not leaving the Work too obfcure; to fave room, and
not to be too prolix; and to this End, I fhall only give the
Examples ftated, and a little of the Work, and the Anfwers
to the Queftions; leaving moft of the Operations to be per-
formed by the ingenious Practitioners.

<div align="center">

Example 3.

</div>

If 56 *lb.* of Indico coft 11 *l.* 4 *s.* what will 1008 *lb.* coft
at that Rate?

lb.   *s.*   *lb.*

If 56—224—1008? *Anfwer*, 4032 *s.* or 201 *l.* 12 *s.*

<div align="center">

Example 4.

</div>

If half a C. Wt. of Rofe Copper coft 4 *l.* 18 *s.* what
Quantity will 14 *s.* buy at that Rate?

s.   *lb.*   *s.*

If 98 buy 56 what 14? *Anfwer*, 8 *lb.* of Copper.

<div align="center">

Example 5.

</div>

If 4 C. 3 qrs. of Sugar coft 5 *l.* 15 *s.* 7 *d.* what will
Hogfheads come to, weighing 42 C. 1 *qr.* 14 *l.*

lb.   d.   lb.

If 532—1387—4746 ? *Anfwer*, 12373 Pence, or 51 *l.*
s. 1 *d.* And the Remainder 266 ; multiplied by 4, gives
[10]64 ; which alfo divided by the firft Number 532, gives
Half-penny more ; fo the whole is 51 *l.* 11 *s.* 1 *d.* ½.
Any of thefe Examples, or any other, may be proved by
back ftating, according as the firft Example was proved ;
[an]d each Proof becomes another Queftion in the Rule of
[th]ree, as was faid before.

Example 6.

If I have 50 *l.* a Year Salary, how much is due to me for
[14]4 Days Service at that Rate ?

Days.   l.   Days.

If 365—50—144 ? *Anfwer, l.* 19—14—6 $\frac{90}{365}$ Parts of
[a p]enny.

In this Example, the Product of the third by the fecond
[Nu]mber is 7200 ; which divided by the firft 365, (accord-
[ing] to the Rule) quotes 19 Pounds, the Name of the middle
[Nu]mber, and there is a Remainder of 265 ; which multi-
[plie]d by 20, according to *Reduction.* and the Product ftill
[divi]ded by 365, there comes out 14 Shillings ; and yet there
[is a] Remainder of 190, which multiplied by 12, and the
[Pro]duct divided by 365, gives 6 *d.* and there's a Remainder
[...] which multiplied by 4 (the laft inferior Name) and
[divi]ded by 365, yet it would not come to a Farthing more ;
[fo t]hat the Anfwer is as above, *l.* 19—14—6 $\frac{90}{365}$.

[Y]ou are to note always, *That when any thing remains that*
[is r]educible to an inferior or lower Name ; after multiplied as
[abo]ve, it muft continually be divided by the firft Number.

[N]ote alfo, *When the firft of the three given Numbers is an*
[Uni]t, or One, the Work is performed, or Anfwer found by
[Mul]tiplication.

Example 7.

If I am to give 17 *s.* for 1 *lb.* of *Belladine* Silk, what
[fhall] I give for 264 *lb.* at that Rate ?

lb.   s.   lb.

1———17———264
          17
        ————

Anfwer 4488 or 224 *l.* 8 *s.*

Example 8.

I buy 49 Bags of Hops, at 12 *l.* 12 *s.* 6 *d.* per Bag,
[what do] come they to at that Rate ?

G   B 1

Bags.		*l.*	*s.*	*d.*	
1	——	12 — 12 — 6			—— 49 Bags.

7 and by 7.

$$88 — 07 — 6$$
$$7$$

$$618 — 12 — 6 \; Answer.$$

The foregoing Work is performed by the component Parts
of *Multiplication of Money*, as taught in that Rule.

When the Third or Last of the three given Numbers is
an Unit or One, then the Work is performed by *Division*.

Example 9.

If 12 Ells of Holland cost 3 *l.* 6 *s.* what is the Price of
1 Ell at that Rate ?

Ells   12) *s.*   Ell.
If 12 ———— 66 ———— 1 *Answer* 5 *s.* 6 *d.*

$5 \frac{6}{12}$ of 1 *s.* or 6 *d.*

Example 10.

If 56 Yards of Broadcloth cost 40 *l.* 12 *s.* what comes
a Yard to at that Rate ?

Yds   7) *l.*   *s.*   Yd.
If 56 ———— 40 — 12 ———— 1 *Answer* 14 *s.* 6 *d.* per Yd.

8) 5 — 16

0 — 14 — 6 *d. Answer.*

This Example is wrought by *Division of Money*, and the
Component Parts ; as before taught in the *Rule of Division*.

Example 11.

If *A* owes *B* 296 *l.* 17 *s.* and compounds at 7 *s.* 6 *d.*
the Pound ; what must *B* take for his Debt?

s.   *d.*   *s.*
If 20 ———— 90 ———— 5937 *Answer l.* 111 — 6 — 4½

Example 12.

If a Gentleman hath an Estate of 500 *l.* a Year, what
may he expend daily, and yet lay up 12 *l.* 15 *s.* per Month

First multiply 12 *l.* 15 *s. per* 12, the Months in a Year, and it makes 153 *l.* which deducted from 500 *l.* the Remainder is 347 *l.* Then say,

Days.   *l.*

If 365 ———— 347, what 1 Day ? *Answer* 19 *s.*

After you have reduced the Pounds into Shillings, which make 6940; you divide them by 365, and the Quotient is 19 *s. per* Day.

The Rule of Three Reverse, or of Indirect Proportion.

W HAT *Indirect Proportion* is, hath been hinted already.

In *Direct Proportion,* the Product of the First and Fourth Numbers, is equal to the Product of the Second and Third.

But in this *Proportion,* the Product of the Third and Fourth Numbers, is equal to the Product of the First and Second.

The Method of stating any Question in this Rule, is the same with that of the *Direct Rule.*

For the First and Third Numbers must be of one Name, so reduced, as in that Rule ; and the Number that moves the Question must possess the Third Place ; and the Middle Number will be of the same Name with the Answer, as it is there.

To know when the Question belongs to the Direct, *and when to the* Reverse Rule.

When the Question is stated as abovesaid, consider whether the Answer to the Question ought to be more or less than the Second Number ; if more, then the lesser of the First and Third Numbers must be your *Divisor.*

But if Less, then the Bigger of the two extreme Numbers must be your *Divisor.*

And if the First Number of the Three is your *Divisor,* then the *Proportion* is *Direct* ; but if the last of the Three given Numbers is your *Divisor,* the *Proportion* is *Indirect* or *Reverse.*

Or without Regard, either to *Direct,* or *Reverse* :
If more is required, the Lesser ⎰ is *Divisor.*
If less, the Greater ⎱

Examples for Explanation.
Example 1.

If 4 Men plain 250 Deal Boards in 6 Days ? how many Men will plain them in 2 Days ?

If 6 Days require 4 Men, what 2 Days ? *Answer* 12 Men.

$$6$$
$$\overline{}$$
$$2)\ 24$$
$$\overline{}$$
$$12\ Answer.$$

Example 2.

If a Board be 9 Inches Broad, how much in Length will make a square Foot ?

| In B. | | In L. | In B. |

If 12 ———————12 what 9 Inches broad ?

$$12$$
$$\overline{}$$
$$9)\ 144$$

Answer 16 Inches ~~broad~~. *Length*.

In this Example, the First and Second Numbers are multiplied together, (as they always muft be) and their Product is divided by the Third ; as is the Example above; and agreeable to the aforesaid Affertion ; for in the firft Example, it is moft certain, that 2 Days will require more Hands to perform the Work than 6 Days ; therefore the Leffer of the extreme Numbers is the *Divifor* ; and declares the Queftion is in the *Indirect Proportion*.

Likewife in the Second Example, 9 Inches in Breadth muft needs require more in Length to make a Foot, than 12 Inches in Breadth ; wherefore it is in the *fame Proportion* with the firft Example, becaufe the *Divifor* is the Third Number.

Example 3.

How many Pounds of Coffee, at 5 s. 9 d. *per lb.* is equivalent in Value with 426 Pounds of Tea, at 13 s. 4 d. *per*

| d. | lb. | d. | lb. |

If 160 give 426, what 69 ? *Answer* 987 $\frac{57}{60}$.

Here it is manifeft that there muft be more Pounds of the Coffee than the Tea ; therefore 69 is the *Divifor*, which is the Third Number, &c.

Exam

Example 4.

How many Yards of Sarcenet, of 3 *qrs.* wide, will line Yards of Cloth, of 8 *qrs.* wide?

qrs. wide. yds long. qrs. wide.

If 8————9 what 3

         8   Here the narrower the Silk

      —   the more in Length is required.

3) 72

Yards   24 *Answer.*

Example.

If a Quartern Loaf weigh 4 *lb.* $\frac{1}{2}$ when Wheat is 5 *s.* 6 *d.* the Bushel; what must it weigh when Wheat is 4 *s.* the Bushel?

  d. $\frac{1}{2}$ *lb.*   *d.*   *lb.*

If 66————9————48 *Answer* 6$\frac{1}{8}$.

Example 6.

If in 12 Months 100 *l.* Principal gain 5 Pounds Interest; what Principal will gain the same Interest in 5 Months?

  M.   *l. P.*   *M.*

  12————100————5

        12

5) 1200

Answer, 240 *l.* Principal.

The Double Rule of Three Direct.

IN this Rule there are Five Numbers given to find out a Sixth, in Proportion to the Product of the Fourth and fifth Numbers, as the Third Number bears to the Product the First and Second Numbers.

Questions in this Kind of *Proportion,* are wrought either two Operations in the *Single Rule of Three Direct,* or by Rule composed of the Five given Numbers, and the may be a Proof to the other; as may be seen in the ample following.

G 3   *Example*

Example 1.

If 100 Pounds Principal, in 12 Months, gain 5 Pounds Interest; what will 246 Pounds Principal gain in 7 Months?

If 100 gain 5 what 246

$$\underline{5}$$

$$1|00) \ 12|30$$
$$\underline{20}$$

$$1|00) \ 6|00 \ \textit{Answer} \ 12 \ \textit{l.} \ 6 \ \textit{s.}$$

$$\begin{array}{cccc} M. & l. & s. & M. \end{array}$$

Then say again, If 12 gain 12—6 what 7

$$20$$

$$\underline{246}$$

$$\underline{7}$$

$$12) \ 1722$$
$$\underline{} \ \textit{d.}$$

$$20) \ 14,3 \ 6$$

$$\textit{l.} \ 7,3 \ 6 \ \textit{Answer.}$$

In the First Stating, the Answer is, that if 100 *l.* gain 5 Pounds, the 246 *l.* will gain 12 Pounds, 6 Shillings.

Then I say in the next Stating; If 12 Months gain 12 *l.* 6 *s.* what will 7 Months gain? And the Answer of the Work is, *l.* 7——3——6. And so much will 246 Pounds gain in 7 Months, if 100 Pounds gain 5 Pounds in 12 Months.

You must particularly note, That in all Operations where the Answer to the Question is found by two Rules of Three, the Answer of the first Stating is ever the middle Number of the second Stating or Work; as in the preceding Examples is plainly seen.

The foregoing Queſtion anſwered by a Rule compoſed
of the five given Numbers, thus :

(1) l.	(2) M.	(3) l.	(4) l.	(5) M.
If 100 ——	12 ——	5 ——	246 ——	7
12			5	
1200			1230	
			7	

In this Work, in ſtating the
Queſtion, the firſt and fourth
Numbers are made of one Name,
and the ſecond and fifth ; and
then the two firſt Numbers are
multiplied together for a Divi-
ſor, and the laſt three Numbers
are multiplied together for a Di-
vidend, and the Quotient or An-
ſwer is in the ſame Name with
the Middle Number, *viz.*
Pounds Intereſt, as in the
Work I find the firſt Quotient
7 Pounds Intereſt ; and ſo I
proceed from one Denomina-
tion to another, till I find the

```
1200) 8610 (7 l.
      8400
      ----
       210
        20
      --------
1200) 4200 (3 s.
      3600
      ----
       600
        12
      --------
1200) 7200 (6 d.
      7200
      ----
       (0)
```

ſame Anſwer, as in the Work at two Statings, *viz. l.* 7—3—6.
This Method of Operation ſerves to anſwer all Queſtions
in the *Double Rule of Three Direct.*

The Double Rule of Three Reverſe.

IN this Rule you muſt place your Numbers in ſuch Or-
der, that your Second and Fourth Numbers may be of
one Name or Denomination, and your Third and Fifth.

Example.

If 100 *l.* Principal, in 12 Months, gain 6 *l.* Intereſt ;
what Principal will gain 20 *l.* Intereſt in 8 Months ?

Stated

Stated thus :

l. P.	Mo.	*l. Int.*	Mo.	*l. Int.*
(1)	(2)	(3)	(4)	(5)
If 100	12	6	8	20
12			6	

1200   48 the Divisor.
20

48) 24000 (500 *l.* P. *Answer.*
240

(0)

In this Work, the third and fourth Numbers are multi-
plied together for a Divisor ; and then the first is multi-
plied by the second, and that Product by the fifth Number,
and the Product 24000 is divided by 48, and the Quotient
is 500 *l.* Principal ; which is what will gain 20 *l.* Interest,
in 8 Months, and the Answer to the Question, as may be
seen in the Work.

Rules of Practice.

THESE Rules are so called from their frequent Use and
Brevity in casting up most Sorts of Goods in Mer-
chandize.

Note, *That any Question in the Rule of Three, when the*
first Number in stating is 1, *it is most briefly done by those*
Rules called Practice.

But previous to these Rules, it is necessary to have the
following Tables by Heart.

Parts of a Shilling. Of a Pound.   Parts of a Pound.

d.			s. d.	
6 is	$\frac{1}{2}$	$\frac{1}{40}$	10 0 is	
4	$\frac{1}{3}$	$\frac{1}{60}$	6 8	
3	$\frac{1}{4}$	$\frac{1}{80}$	5 0	
2	$\frac{1}{6}$	$\frac{1}{120}$	4 0	
$1\frac{1}{2}$	$\frac{1}{8}$		3 4	
1	$\frac{1}{12}$		2 6	
			2 0	
			1 8	
			1 0	

Parts of a Shilling.   *Example* 1.

6 *d.* is | 426 Pounds of Sugar, at 6 *d. per lb.*
¼ 1 *s.* |
       ————————
      2|0) 21|3

      l. 10|13 *Answer.*

Here 6 *d.* being the Price of each *lb.* and the half of a Shilling; therefore the half of 426 is taken, and gives 213 *s.* or 10 *l.* 13 *s.*

<p align="center">*Example* 2.</p>

4 *d.* is ⅓ | 512 *lb.* of Cheese, at 4 *d. per lb.*
of 1 *s.* |
      ————————
     2|0) 17|0—8 *d.*

     l. 8, 10, 8 *Answer.*

Here 4 *d.* is ⅓ of a Shilling; therefore the Third Part of 12 is 170 *s.* and ⅔ of a Shilling, or 8 *d.* remains.

Note, *Always what remains is of the same Name with the Dividend, which here is Groats, for the Pounds of Cheese are at a Groat each.*

<p align="center">*Example* 3.</p>

d. is ¼ | 246 Yds of Ribband, at 3 *d. per* Yards
of 1 *s.* |
      ————————
    2|0) 6|1—¾ of a Shilling or 6 *d.*

    l. 3--1--6 *Answer.*

Here the Yards are divided by 4, because 3 *d.* is the 4th of a Shilling; and it quotes 61 Shillings, and 2 remains, or two 3 Pences: So the Answer is *l.* 3--1--6.

And thus may any proposed Question be answered, belonging to the first Table, or Parts of a Shilling; that is, by dividing the given Number by the Denominator of the Fraction, and the Quotient will be always Shillings, which the Remainders being known as above) bring into Pounds, by dividing by 20, &c.

When the Price of the Integer is at a Farthing, a Half-penny, or three Farthings more than the Price of Pence mentioned, then for those Farthings take their even Part of the foregoing Quotient taken for the even Part of a Shilling, and add, &c.

            Examples.

Examples.

249 Ells of Canvas, at 4 ½ *per Ell.*

4 *d.* is $\frac{1}{3}$ | 83
½ *d.* is $\frac{1}{8}$ | 10 $\frac{3}{8}$ or 4 *d.* ½ *Answer.*
of 4 *d.* |

2|0)9|3-4 ½ *Answer.*

4--13--4 ½

In this Example I divide by 3 for the Groats, as being the
Third of one Shilling, and it quotes 83 *s.* then I consider
that a Half-penny is the Eighth of 4 *d.* therefore I take the
Eighth Part of the Groat Line, or 83 *s.* and that produces
10 *s.* and $\frac{3}{8}$ of a Shilling, or 4 *d.* ½ ; then the two Lines be-
ing added together, make 93 *s.* 4 *d.* ½, or 4 *l.* 13 *s.* 4 *d.* ½,
as in the Work.

Parts of a Pound.

10 *s.* is ½ | 254 Yards of Cloth, at 10 *s. per* Yard.

l. 127 *Answer.*

Here the Half of 254 is taken, because 10 *s.* is the half
of a Pound.

s.   *d.* | 972 Gallons at 6 *s.* 8 *d. per* Gallon.
6—8 $\frac{1}{3}$ |

l. 324 *Answer.*

Here the third Part is taken, because 6 *s.* 8 *d.* is the
third of a Pound ; and the Answer is *l.* 324.

And thus may any Question proposed be answered, be-
longing to the second Table, or Parts of a Pound ; that is
by dividing the given Number by the Denominator of the
Fraction, and the Quotient will be always Pounds ; and if
any thing remains, it is always so many Halves, Thirds,
Fourths, or Fifths, &c. of a Pound, according to the Deno-
minator that you divide by.

If the Price be Shillings and Pence, or Shillings, Pence
and Farthings, and no even Part of a Pound ; then multiply
the given Number by the Shillings in the Price, and take
even Parts for the Pence, or Pence and Farthings, and add
the several Lines together, and they will be Shillings ; which
Shillings bring into Pounds, as before.

Examples.

l.   s.   d.

426 at 4—9
  4
_____
1704
 213
 106½ or 6 *d.*

6 *d.* ½ |
3 *d.* ¼ |

2|0) 202|3
_____
l. 101-3-6 *Answ.*

3 *d.* ¼
½ *d.* ⅙
of 3 *d.*

Ells   s.   d.
216 at 2 -3½
  2 *per* Ell.
_____
432
 54
  9
_____
2|0) 49|5 *s.*
_____
l. 24'15 *Answer*

396 Gallons of Brandy, at 7 *s.* 9 *d.*
per Gallon.
      7
_____
2772
 198
  99
_____
2|0) 306|9
l. 153|9 *Answer.*

d. ½ 1 *s.*|
d. ½ 6 *d.*|

When the Price is 10 *d.* only annnex o to the Right of the given Number (which is multiplying by 10) and they Pence; which divide by 12, and by 20.
Example; 426 *lb.* of Hops at 10 *d. per lb.*

12) 4260
_____
2|0) 35|5
_____
l. 17-15 *Answer.*

When the Price is 11 *d.* set down the Quantity twice in the form of Multiplication, and add the two Lines together; then divide by 12, and by 20. *Example*,

426 *lb.* of Copper, at 11 *d. per lb.*

426

12) 4686 *Pence*,
_____
|0) 39|6
_____
l. 19,10,6 *Answer.*

If the Price be 11 *d.* ½, take half of the uppermost Line, &*c.*

Example.

942 *lb.* of Tobacco, at 11 *d.* ½ *per lb.*

942
471
───────
12) 10833 *Pence.*

2|0) 90|2—9 *d.*

l. 45——2——9 *Answer.*

When the Price is 1 *s.* only divide by 20.

Example.

2|0) 96|4 *lb.* of Tobacco, at 12 *d. per lb.*

l. 48-4 *Answer.*

When the Price is 2 *s.* it is done at fight by doubling the last Figure toward the Right-hand, and fetting it apart for Shillings; and the Figures toward the left are Pounds.

Example.

596 Gallons of Spirits, at 2 *s. per* Gallon.

l. 59--12 *Answer.* Here the Double of 6 is 12 *s.* and the 59 are Pounds.

From this Method of Working by 2 *s.* a Multitude of Examples may be moft expeditioufly wrought, *viz.*

		Ells.		*Yards.*	
		444 Cambrick.		426 at 3 *s.* 6 *d.*	
		—— . at 5 *s.* 9 *d.*		——-- *per* Yard.	
		44—8 at 2 *s.*		42—12 at 2 *s.*	
		44—8 at 2 *s.*	1 *s.* ½ 2 *s.*	21—6 at 1 *s.*	
1 *s.* ½ of 2 *s.*		22—4 at 1 *s.*	6 *d.* ½ 1 *s.*	10—13 at 6 *d.*	
6 *d.* ½ of 1 *s.*		11—2 at 6 *d.*		───────	
3 *d.* ½ of 6 *d.*		5--11 at 3 *d.*		*Answer l.* 74—11 at 3—6 *d.*	

Answer, l. 127—13 at 5—9 *d.*

The Operation of these two Examples is fo intelligibly wrought, that there is no need of verbal Explanation.

Again

Again, 548 Yards of Broadcloth, at 12 *s.* 6 *d. per* Yard.

l. 54, 16 at 2 *s* 6 times 2 *s.* is 12 *s.*

d. is | 328,16 at 12 *s.*   Note, *That* 13 *l.* 14 *s. is the*
of 2 *s.* | 13,14 at 6 *d.*   *fourth Part of* 54 *l.* 16 *s. the*
                                two Shilling Line.

l. 342,10 *Anſwer.*

Or multiply by 12 *s.* and take half of the given Number
for the 6 *d.* thus :

548 Yards.
12

6576
½) 274

2|0) 685|0
l. 342—10 *Anſw.*

When the Price is an even Number of Shillings, multiply
the Number of Integers by half the Price, and double the
firſt Figure of the Product for Shillings, and carry as is uſual
in Multiplication, and the other Figures toward the left will
be Pounds.

Example.

296 Yards of Cloth, at 14 *s. per* Yard.
7 the half of 14 Shillings

l. 207—4 *s. Anſwer.*

Here 7 times 6 is 42; the Double of 2 *s.* is 4 *s. &c.*
When the Price is an odd Number of Shillings, work for
the even Number as above; and for the odd Shillings, take
the 1/20 of the given Number, and add them together.

Example.

496 Gallons of Citron Water, at 17 *s. per* Gall.
8 the half of 16, or even Part.

396—16 *s.*
24—16

l. 421—12 *Anſwer.*

In

In this Example I say, 8 times 6 is 48; the Double of 8 is 16 *s.* and carry 4; then 8 times 9 is 72, and 4 is 76; 6 and carry 7; and 8 times 4 is 32, and 7 is 39; then the half of 4 is 2, *&c.*

Even Parts of a Pound.

	Yards.	Nobles. *s. d.*
10 *s.* is ⅓	426 of Cloth, at 10 *s.* —— *per* Yard.	429 at 6—8 each.
	213 *Anſwer.* 6—8 *d.* ⅓	*l.* 143 *Anſwer.*

	lb.	*lb.*
	598 of Cocheneal, at 5 *s. per lb.* 4 *s.*	154 of Indico, at 4 *s.* per *lb.*
5 *s.* is ¼	*l.* 149 ²⁄₄ or 10 *s. Anſwer.* is ⅕	*l.* 30 ⅘ or 16 *s. Anſwer.*
3 *s.* 4 *d.* is ⅛	542 *Zeland* Dollars, at 3 *s.* 4 *d.*	

90 ⅔ or 6 *s.* 8 *d. Anſwer, l.* 90—6—8 *Sterling.*

In all these Examples of Practice, I divide by the Denominator of the Fraction, and what remains is always of the same Name with the Denominator; as one Half, Thirds, Fourths, Sixths, or Eighths of a Shilling, or of a Pound, *&c.*

If the Price be Half a Crown, divide by 8; if at 20 *d.* or 1 *s.* 8 *d.* divide by 12, *&c.*

When the Price is Shillings and Pence, and no even Part of a Pound; multiply the given Number by the Shillings, and take Parts of it for the Pence, as directed before.

Example.

246 Marks, at 13 *s.* 4 *d.*

	13	
4 *d.* ⅓	738	For the Groat, I say the 3's in 24, 8 times; and the 3's in
1 *s.*	246	6, twice, *&c.*
	82	

2|0) 328|0 *s.*

l. 164 *Anſwer.*

But this Example may be ſooner done by multiplying the given Number by 2, and dividing that Product by 3, (becauſe a Mark is two Thirds of a Pound) thus :

$$\begin{array}{r} 246 \\ 2 \\ \hline \end{array}$$

3) 492
l. 164 *Anſwer* and *Proof.*

I have not here Room to ſpeak of the various and almoſt infinite Methods and Rules of *Practice* (having ſeveral other Subjects and Things to treat on) but ſhall leave ſome general Rules, which if heedfully noted, will be of great Uſe to Learners ; and are theſe, *viz.*

1. When the Price is Parts of a Farthing, or of a Penny, as 3/4, 5/6, 7/8, *&c.* then multiply the Integers by the Numerator, and divide by the Denominator, and the Reſult will be either Farthings or Pence ; which reduce to Pounds, *&c.*

2. When the Price is Pence, and no even Part of a Shilling ; as ſuppoſe 5 *d.* 7 *d.* 8 *d.* or 9 *d.* then it may be done by taking their Parts, as 3 *d.* and 2 *d.* is 5 *d.* and 4 *d.* and 3 *d.* is 7 *d.* and 4 *d.* and 4 *d.* is 8 *d.* and 6 *d.* and 3 *d.* is 9 *d.* but it is an eaſy and ſure Way to multiply the given Number by 5, 7, 8, or 9, and then the Product is Pence ; which reduce to Pounds by *Reduction.*

3. When the Price is Pence, and Parts of a Penny ; as 1 *d.* 1/4, 2 *d.* 1/2, or 6 *d.* 3/4, then work for the Penny by taking the 1/12 ; for 2 *d.* the 1/6 ; and for 6 *d.* the 1/2 : Then for the Farthings, take 1/4 of the Penny Line, and for 1/2, 1/4, of the Two-penny Line ; and for 3/4, take 1/8 of the 6 Penny Line ; then add their Reſults together, and the Total will be Shillings, which reduce to Pounds by dividing by 20. Or by the ſure Way of bringing the mixt Number into the loweſt Denomination ; as 1 *d.* 1/4, into 5 Farthings, 2 *d.* 1/2, into 5 Half pence, and 6 *d.* 3/4, into 27 Farthings ; then multiply the Integers by 5, and the Product is Farthings ; or by 5 Half-pence, and the Product will be Half-pence ; or by 27 Farthings, and the Product will be Farthings ; which, whether Farthings or Pence, reduce to Pounds, *&c.*

4. When the Price is Shillings and Pence, or Shillings, Pence, and Farthings, multiply the Integers by the Shillings of the Price, and take Parts for the Pence, or Pence and Farthings, *&c.*

5.

5. If the Price be Pounds and Shillings, or Pounds, Shillings, Pence and Farthings; multiply by the Shillings in the Price, that is, in the Pounds and Shillings, and take Parts for the Pence and Farthings.

6. When the Number of Integers hath a Fraction annext, or belonging to them; as $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, &c. then take $\frac{1}{4}$, $\frac{1}{2}$, or $\frac{3}{4}$ of the Price of one of the Integers, and add that to the other Results.

T A R E and T R E T T, &c.

Gross Weight is the Weight of the Goods in Hundreds, Quarters, and Pounds, with the Weight of the Hogshead, Cask, Chest, Bag, Bale, &c. that contains the Goods.

Tare is allowed to the Buyer for the Weight of the Hogshead, Cask, Chest, Bag, Bale, &c.

Trett is an Allowance made for Waste, Dust, &c. in sundry Sorts of Goods, as Tobaccoes, Cottons, Peppers, Spices, &c. and is always 4 *lb. per* 104 *lb.* Suttle, and found by dividing the Suttle Pounds by 26, because 4 times 26 makes 104 *lb.* When the Gross Weight is brought into Pounds, and before the Tare is deducted, they are called *Pounds Gross*; and after the Tare is subtracted, the remaining Pounds are called *Pounds Suttle*; which divided by 26 (as said before) quotes Pounds Trett, &c.

Tare at so much per Cask, Hogshead, Bag, &c.

The Allowances for Tare are variously Wrought, as by the following Examples.

In 12 Casks of Indico, containing 45 C. 1 *qr.* 14 *lb.* Gross, Tare 30 *lb. per* Cask, how many Pounds Nett?

12 Casks	C.	qr.	lb.
	45	1	14
360 Pounds Tare	45		
	45		
	4542		

5082 Pounds Gross
subtract 360 Pounds Tare.

Answer 5722 Pounds Nett.

In this Example, the *lbs.* Tare of one is multiplied by the Number of Casks, and the Product is 360 Pounds Tare, and the Gross Weight is reduced into Pounds by the Method shewn

ewn in Reduction of Weight; and then the Pounds Tare e deducted from the Pounds Grofs, and the Remainder are ounds nett, *viz.* 4722, as in the Work.

When the Tare is at fo much *per C. wt.* multiply the umber of Hundreds by the Tare, and take P. r s for the d Weight, and add it to the Tare found by Multiplica- on, and divide it by 112 to bring it into Grofs Weight, order for Subtraction. *Example.*

What is the Nett Wt. of 12 Cafks of Argol, wt. Grofs,

$$84 \, C. \, 2 \, qrs. \, 14 \, lb.$$
$$14 \, \text{Tare} \, per \, C.$$

$$\begin{aligned} &336 \\ &84 \\ &7 \text{ for half } C. \\ &1\tfrac{3}{4} \text{ for } 14 \, lb. \end{aligned}$$

C.	qrs.	lb.	
84	2	14	Grofs.
10	2	8 ¾	Tare.
74	0	5 ¼	Nett Wt.

$$112) \, 1184\tfrac{1}{4} \, (10 \, C.$$
$$112$$

$$64 \, lb. \text{ or half a } C. \text{ and } 8 \, lb.$$

The Tare in the laft Example is to be found by the fore-ing Directions, 10 *C.* 2 *qrs.* 8 *lb.* ¾, which fubtracted as the Work, leaves 74 *C.* 0 *qrs.* 5 *lb.* ¼ for the Nett Wt. But the foregoing Example may be fooner done by *Prac-e*, thus;

C.	qrs.	lb.	
8) 84	2	14	Grofs
fub. 10	2	8 ¼	Tare
74	0	5 ¼	Nett

In this Method, the Grofs Weight is divided by 8, be-ufe 14 *lb.* is one Eighth of 112 *lb.* and the Remainder is uced into the next inferior Name, and ftill divided by 8, the End, and then deducted as above, and the Nett. eight is the fame as by the other Way. And fo may any re *per Cent.* be found, if the Tare be an even Part of. 2 *lb.* as 14 is one Eighth, and 7 *lb.* is the half of that, d 16 *lb.* is one Seventh, and 8 *lb.* is half of that, *&c.* t is, if the Tare be at 7 *lb. per C.* find it for 14 *lb.* as fore, and then take the Half of that for 7 *lb. per C.*

Tare

Tare, the like for 8 *lb. per* C. Tare; take one Seventh for
1·6 *lb.* and then the half of that for 8 *lb. per* C. Tare.

Of TRETT.

What *Trett* is, when allowed, and how found, hath been
said already; now I shall give an Example for Explanation
as follows.

Bought Six Hogsheads of Tobacco, containing Grofs and
Tare as follows; *viz.*

N.		C. qrs. lb.	lb.
1	qt.	4—1—20	Tare 8
2		5—2—19	100
3		6—3—18	100
4		7—3—12	100
5		8—2—13	100
6		9—1—14	110

26) 4198 161 *lb.* Trett.　　　42—3—12　　60
　26··　　　　　　　　　　　　42
　　　　　　　　　　　　　　　42
　159　　　　　　　　　　　42|96
　156

　38　　　**subtract**　　4800 Pounds Grofs.
　26　　　　　　　　　　602 Pounds Tare.

　12　　　**deduct**　　4198 Pounds Suttle.
　　　　　　　　　　　161 $\frac{6}{13}$ Pounds Trett.

　　　　　　　　　　　4036 $\frac{7}{13}$ Pounds Nett.

There are some few other Rules, such as Barter, or ex-
changing Goods for Goods; also Exchange for Coin, Profit
Lofs, &c. but all of them being done either by the Rule of
Three, or by Rules of Practice, it is therefore here unne-
ceffary to enlarge upon them.

Of FRACTIONS *Vulgar and Decimal.*

WHAT *Fractions* are, hath already been hinted in the
Rule of *Divifion*, from whence they arife; for the
Remainder is a fuppofed Part of the Divifor; as admit 54
is divided into twelve equal Parts, the Quotient is 4, and the
Remainder 6: So that here 6 is fix Parts of 12, or fix
Twelfths, equal to a half; for 6 is the $\frac{1}{2}$ of 12; and fet
down in this Form $\frac{6}{12}$, and underftood by thefe Names, *vide*

6 *Numerator.*

———

12 *Denominator.*

The *Numerator* is above the short Line, and sheweth the
number of Parts ; and the *Denominator* stands under the
line, and declares the Number of equal Parts the Integer or
whole Number is divided into ; as above 54 *l.* is divided
into 12 Parts, and the Quotient says there are 4 of those 12
Parts contained in 54, and 6 remains, or 6 Twelfths of a
Pound, or 10 *s.* as above-said.

Fractions are thus set down and read, *viz.* ¼, one Fourth ;
one Half ; ⅓, one Third ; ⅕, one Fifth ; ⅙th, one Sixth ;
two Thirds ; ²⁄₄, two Fourths ; ²⁄₆, two Sixths ; ⁵⁄₇, five Se-
venths, &c.

Fractions are either proper or improper : A proper Frac-
tion hath its Numerator less than the Denominator ; as ⅝ five
Eighths ; ²⁴⁄₅₆, twenty-four Fifty-sixths, &c.

An improper Fraction hath its Numerator greater than
the Denominator ; as ⁷⁄₃, seven Thirds ; ⁴⁸⁄₁₃, forty-eight Fif-
teenths, &c.

Again, Fractions are either Simple or Compound ; simple,
when Part of an Integer or Thing hath but one Numerator,
and one Denominator ; as ¾ of a Pound Sterling, ½ of a C.
Weight, ⅔ of a Tun, ⅛ of a Gallon, &c. Compound, is a
Fraction of a Fraction, as the ½ of a ¼ of a Pound Sterling
is equal to Half a Crown ; or when one is divided into any
number of Parts, and those Parts again subdivided into
Parts, &c.

Fractions are of two kinds, *viz. Vulgar* and *Decimal.*
Vulgar Fractions are as declared before. *Decimal* Fractions
are artificially expressed by setting down the Numerators only,
the Denominators being understood ; and are always a Unit
with as many Cyphers annext as there are Places in the Nu-
merator ; and therefore must be either 10, or some Power of
it, as 100, 1000, 10000, or 100000, &c.

Decimal Fractions appear as whole Numbers, (and in the
general so wrought) but are distinguished from them by a
Point or Comma prefixed thus, ,5, and is read five Tenths ;
,32, thirty-two Hundredths ; ,256, two Hundred 56 Thou-
sandths : But of *Decimal* Fractions and their Use hereafter.

Reduction of Vulgar Fractions, is to fit or prepare them for
Addition, Subtraction, &c.

1. *To reduce a mixt Number to an improper Fraction.*
Rule.
Multiply the Integer by the Denominator, and take in the Numerator.

Example.
Reduce 12 Gallons ¾ to an improper Fraction, thus,

$$\frac{4}{51}$$

$\overline{4}$ *Answer* 51 Fourths, or 51 Quarts.

2. *To reduce an improper Fraction to a whole or mixt Number.*
Rule. Divide the Numerator by the Denominator.
Example.
Reduce the last Example to a whole or mixt Number, *viz.*

$$\frac{51}{4} \qquad 4)51$$

$$12$$

3 Remainder.
4 Divisor,

Here 12 Gallons is the whole Number, and ¾ the Fraction, the same with 3 Quarts.

3. *To reduce Fractions to a common Denominator.*
Rule.
Multiply the Numerator of each Fraction into all the Denominators, except its own, and the Product will be a Numerator to that Fraction; and then do so by the next, &c.
Example.
Reduce ⅔, ¾, and ⅚ of 20 s. or any other Integer or Thing to a common Denominator; say, twice 4 is 8, and 6 times 8 is 48, for a new Numerator to ⅔; then say, 3 times 3 is 9, and 6 times 9 is 54, for a new Numerator to ¾; lastly say, 5 times 4 is 20, and 3 times 20 is 60, the Numerator to ⅚: Then, to find the common Denominator, say 3 times 4 is 12, and 6 times 12 is 72, the common Denominator: So that 48/72 is equal to ⅔, 54/72 to ¾, and 60/72 to ⅚. And thus proved:

of a Pond is	13	4	48
ditto	15	0	54
ditto	16	8	60

Added together made 162.

| | 45 | 0 | 162 | Common Denominator. |

Here the several Numerators are added together, and they make 162; which placed over the common Denominator 72, make the Improper Fraction $\frac{162}{72}$; and its Value is found as before directed, *To reduce an improper Fraction to a whole or mixt Number*; as may be seen in the foregoing Page.

4. To reduce a Fraction into its lowest Terms.

Rule.

If they are even Numbers, take half of the Numerator, and Denominator as long as you can; and then divide them by any digit Number *(i.e. 3, 4, 5, 6, &c.)* that will leave no Remainder in either.

Example.

Reduce $\frac{56}{84}$ into its lowest Terms; say the $\frac{1}{2}$ of 56 is 28, and the $\frac{1}{2}$ of 84 is 42; and then, the $\frac{1}{2}$ of 28 is 14, and the $\frac{1}{2}$ of 42 is 21: So the Fraction $\frac{56}{84}$, is reduced to $\frac{14}{21}$. And since they both are not to be halved any longer; for though you can half 14, yet you cannot 21, without Remainder; try therefore to divide them by some other digit Number, and you will find, that 7 will divide both Numerator and Denominator without any Remainder; then say, the 7's in 14, twice; and the 7's in 21, three times: So is the Fraction $\frac{56}{84}$ reduced into its lowest Terms, $\frac{2}{3}$ two Thirds; and is the same in Value with $\frac{56}{84}$, and done in this Form:

$$\overset{2}{56} \mid \overset{2}{28} \mid \overset{7}{14} \mid 2$$
$$84 \mid 42 \mid 21 \mid 3$$

And the Certainty that $\frac{2}{3}$ is the same in Value with $\frac{56}{84}$ is found by multiplying any Integer by the Numerator of each Fraction, and dividing by the Denominator of each Fraction.

Ex-

Example.

Let the Integer be 1*l.* Sterling, or 20 *s.*

| *The b ft Way.* | *The common Way.* |

The b ft Way.   *The common Way.*

```
      s.                              s.
      20                              20
       2                              56

    3)40                        84) 1120 (13 s.
                                     84
    13-4 d.
                                     280
                                     252                } 13 s. 4d.

                                      28
                                      12

                                     336 (4 d.
                                     336
```

(o)

Here it is manifeft, that by working by a Fraction in its loweft Terms, much Time and Figures are faved. In one Operation, 20, the Integer is multiplied by 2, and the Product 40 divided by 3, and there remains 1, or ⅓ of a Shilling, or a Groat, as in the other Work.

There are other Methods of reducing a Fraction into its loweft Terms; but in my Opinion, none fo ready as the foregoing,

5, *To reduce a Compound Fraction into a Simple one of the*
fame Value.

Rule. Multiply the Numerators together for a Numerator, and the Denominators together for a Denominator.

Example.

Reduce ⅔ of ¾ of ⅚ of a Pound Sterling into a fimple Fraction. Say twice 3 is 6, and 5 times 6 is 30, the Numerator: then 3 times 4 is 12; and 6 times 12 is 72, the Denominator: So ³⁰⁄₇₂ of a Pound is equivalent to ⅔ of ¾ of ⅚ of a *l.* Thus proved, ⅚ of a *l.* is 16 *s.* 8 *d.* and ¾ of ditto, or 16 *s.* 8 *d.* is 12 *s.* 6 *d.* and ⅔ of 12 *s.* 6 *d.* is 8 *s.* 4 *d.* the Anfwer: And multiplying 20 by 30, and dividing by 72, gives the fame Anfwer, as in the following Work plain.

$$20$$
$$30$$

72) 600 (8 s.
576

24 Remains
12 Multiply   8 s. 4 d.

72) 288 (4 d.
288

(0)

To find the *Value of any Fraction, whether of Coin, Weight, or Measure.*

Rule. Multiply the Integer by the Numerator, and divide by the Denominator; and if any thing remain, multiply by the Number of Units of the next inferior Denomination.

Example.

What is $\frac{30}{72}$ of a Pound, or 20 s.? the foregoing Example is Proof to the Compound Fraction $\frac{2}{3}$ of $\frac{3}{4}$ of $\frac{5}{6}$, and as it is worked there, it need not again be repeated.

Again, What is $\frac{5}{6}$ of a Tun Weight?

C.
20 the Integer.
5 the Numerator.

The Denominator 6) 100

C. 16—4 remains.
4 qrs. 1 C.

6) 16

qrs. 2—4 remains.
28 lb. 1 qr.

6) 112

Answer,   lb. 18—$\frac{4}{6}$
C. 2 qrs. 18 lb. $\frac{4}{6}$

Here

Here the Integer 20 *C.* is multiplied by the Numerator and the Product 100 divided by the Denominator 6, and the Remainder 4 is multiplied by the Parts of the next inferior Denomination, &c. and the Answer is 16 *C.* 2 *qrs.* 18 $\frac{4}{6}$, or $\frac{2}{3}$ of a Pound Weight, as in the Work.

Addition of Vulgar Fractions.

1. IF the Fractions to be added have a common Denominator, add the Numerators together for a Numerator, and place it over the common Denominator.

Example.

Add $\frac{2}{5}$, $\frac{3}{5}$, and $\frac{4}{5}$ of a Pound Sterling together. Say, 2 and 3 is 5, and 4 is 9, the Numerator; which place over the common Denominator, thus, $\frac{9}{5}$; and this improper Fraction $\frac{9}{5}$, is in Value 36 *s.* for 9 times 4 *s.* (the 5th of a Pound) is 36 *s.* thus: Here $\frac{4}{5}$ is 16 *s.* I say the 5's in 9 once, and 4 remains, which is $\frac{4}{5}$ of a *l.* Pound.

But if the Fractions to be added have unequal Denominators, then they must be reduced to a common Denominator by the Rule before shewn, before Addition can be made; and then proceed as above.

2. When mixt Numbers are to be added, work with the fractional Parts as before, and carry the fractional Value to the whole Numbers.

Example.

Add 25 *l.* $\frac{3}{4}$ to 12 $\frac{1}{4}$, thus : 25 $\frac{3}{4}$

12 $\frac{1}{4}$

―――

l. 38 *Answer.*

Here 1 and 3, the Numerators, make 4; and $\frac{4}{4}$ is 1; 2 2 is 3, and 5 makes 8; and 1 and 2 is 3, and the Answer 38.

Or they may be reduced to improper Fractions thus :

25 $\frac{3}{4}$	12 $\frac{1}{4}$	103
4	4	49
―――	―――	―――
103	49	4) 152
4	4	38 Pounds.

Here the Numerators are added, and their Total is 152, which divided by 4, the common Denominator, quotes 38 Pounds, the same Answer as above.

3 When Compound Fractions are to be added to Simple
ones, reduce the Compound Fraction to a Simple one, as
before directed ; and then proceed as above.

Example.

Add $\frac{2}{5}$ and $\frac{3}{8}$ to $\frac{1}{2}$ of $\frac{2}{4}$ of a Pound ; thus, once 2 is 2,
and twice 4 is 8, the Compound Fraction : Then add, say-
ing 2 and 3 is 5, and 2 is $\frac{7}{4}$, equal in Value to 17 s. 6 d.

Subtraction of Vulgar Fractions.

IN this Rule, the Fractions must have a common Denomi-
nator, or be reduced to one, before Deduction can be made.

Example.

What is the Difference between $\frac{1}{4}$ and $\frac{3}{4}$? Answer $\frac{2}{4}$; and
proved by Addition : For $\frac{1}{4}$ and $\frac{2}{4}$ makes $\frac{3}{4}$ or 3 quarters.

Note, The Difference between the Numerators is the Dif-
ference of the Fractions.

Again, from $\frac{3}{4}$ of a Pound, take $\frac{5}{12}$: Here the Fractions
are to be reduced to a common Denominator : 36 the first
Numerator, and 20 the second Numerator, and their Dif-
ference is 16 ; and 48 is the common Denominator : So that
$\frac{16}{48}$, or $\frac{1}{3}$, in its lowest Terms, is the Difference between $\frac{3}{4}$
a Pound, and $\frac{5}{12}$ of a Pound ; that is, 6 s. 8 d.

To subtract a Compound Fraction from a Simple one.

Rule. Reduce the Compound Fraction to a Simple one,
and then work as before.   *Example.*

From $\frac{13}{14}$ take $\frac{2}{3}$ of $\frac{8}{9}$; say twice 8 is 16, and 3 times 9 is
27, the Compound Fraction ; Then $\frac{13}{14}$ and $\frac{16}{27}$ must be re-
duced to a common Denominator, thus ; 13 times 27 is 351,
the first Numerator ; and 14 times 27 is 378, the common
Denominator. Then subtract 224 the second Numerator,
from 351 the first Numerator, and the Remainder is 127,
which place over 378 the common Denominator, thus, $\frac{127}{378}$
Answer.

*When a Simple Fraction is to be deducted from a Whole
Number.*

Rule. Subtract the Numerator of the Fraction from the
Denominator, and place the Remainder over the Denomi-
nator, and carry 1 to subtract from the whole Number, &c.

Example.

From 12 l. take $\frac{5}{8}$ thus, say 5 (the Numerator) from 8
(the Denominator) and there remains 3, which place over
the Denominator 8, thus, $\frac{3}{8}$; then 1 from 12 and there
remains 11 ; So the Answer is, l. 11 $\frac{3}{8}$, or l. 11—7—6, as
may be proved by whole Numbers.

H   *Multi.*

Multiplication of Vulgar Fractions.

Rule. MUltiply the Numerators into one another for a Numerator of the Product; and then do the same by the Denominators, for a Denominator of the Product.

Example.

Multiply $\frac{3}{4}$ of a Pound, by $\frac{5}{6}$ of ditto; say 3 times 5 is 15, the Numerator; and 4 times 6 is 24, the Denominator: So the Answer is $\frac{15}{24}$, or in its lowest Terms $\frac{5}{8}$.

You are to note, That Multiplication in Fractions lessens the Product, tho' in whole Numbers it augments it; as above, $\frac{5}{8}$ or 12 *s.* 6 *d.* is less than $\frac{5}{6}$ or 16 *s.* 8 *d.* and also less than the other Fraction $\frac{3}{4}$ to 15 *s.* The Reason of which I have not here Room to insist on; but it is given in my *Arithmetic in Multiplication of Vulgar Fractions*; to which Book I refer the Reader for that, and sundry Enlargements in the several Rules in the Science of *Arithmetic.*

2. *To multiply a Whole Number by a Fraction.*

Rule. Multiply the Integer by the Numerator of the Fraction, and place the Product over the Denominator.

Example.

Multiply 56 *l.* by $\frac{3}{4}$.

$$
\begin{array}{r}
56 \\
3 \\
\hline
168 \\
\hline
4
\end{array}
\Big\} Facit.
$$

This improper Fraction $\frac{168}{4}$ reduced according to Rule makes but 42 *l.* which is less than 56; and confirms what was before asserted, *viz.* that Multiplication of Fractions lessens the Product, &c.

3. *To multiply a Simple by a Compound Fraction.*

Rule. Reduce the Compound Fraction to a Simple one as before taught, and work as above.

Example.

Multiply $\frac{6}{8}$ of a Pound, by $\frac{2}{3}$ of $\frac{3}{4}$ of a Pound: Say 6 times 6 is 36, and 8 times 12 is 96: So that the Answer $\frac{36}{96}$, or $\frac{3}{8}$ in its lowest Terms; equal to 7 *s.* 6 *d.*

Division of Vulgar Fractions.

Rule. MUltiply the Numerator of the Divisor into the Denominator of the Dividend, and the Product is the Denominator of the Quotient; and then multi-

3

the Denominator of the Divisor into the Numerator of the Dividend, and the Product will be the Numerator of the Quotient.

Example.

Divide $\frac{15}{16}$ by $\frac{2}{3}$; $\frac{2}{3}$) $\frac{15}{16}$ ($\frac{45}{32}$ Quotient.

Here 16 multiplied by 2, gives 32 ; and 15 by 3, gives 45 : So that the Quotient is $\frac{45}{32}$, equal to 1 $\frac{13}{45}$, as in the Work.

Again, Suppose $\frac{24}{36}$ was divided by $\frac{2}{3}$, the Quotient will be 1, equal to 1 Integer, or whole Thing. And so any other Example.

Reduction of Decimal Fractions.

WHAT a *Decimal Fraction* is, hath been already shewn. The next step is, how to reduce a Vuglar Fraction into a Decimal : Which is no more than to annex Cyphers at Discretion (that is, 2, 3 or 4, &c.) to the Numerator, and then divide it by the Denominator.

Example 1.

Reduce $\frac{3}{4}$ of a Pound Sterling to a Decimal :

4) 300
———— } that is, 75 Hundredths, equal to 3 qrs of any
,75 } thing, whether Money, Weight, Measure, &c.
being $\frac{3}{4}$ of 100 ; and so, 25 Hundredths is, in Decimals, a Quarter of any Thing, as being $\frac{1}{4}$ of 100 ; and five tenths expresses the half of any thing, as being the $\frac{1}{2}$ of 10. In Reduction of Decimals, sometimes it happens that a Cypher or Cyphers must be placed to the Left-hand of the Decimal, to supply the Defect or Want of Places in the Quotient of Division, or in the Product of Multiplication of Decimals.———In this Case always remember, That so many Cyphers as you annex to the ~~Denominator~~ of the Vulgar Fraction, so many Places you must point off in the Quotient towards the Left-hand ; but if there be not so many Places to point off, then you must supply the Defect by placing o to the left of the Decimal.

Example 2.

Reduce 9 $d.$ or $\frac{9}{240}$ to the Decimal of a Pound Sterling,

∧ *Numerator*

24)

24)0,9000,0(,0375

          72

          ——————   Here is but three Places in the Quotient,
          180   *viz.* 375 ; and therefore I cannot point
          168   off 4 for the four Cyphers annexed to
          ——————   9 ; wherefore I prefix o to the Left of
          120   the Quotient 375, thus ; ,0375, and then
          120   it is the Decimal of 375 ten thousand
          ——————   Parts of an Integer as in the Work.
          (c)

The more Cyphers you annex, the nearer you bring your
Decimal to the Truth : But in most Cases, four Cyphers
annexed is sufficient, But when you are to reduce ¼, ½, or ¾
(as above) of an Integer to a Decimal, or any Number of Shil-
lings to the Decimal of a Pound, two Cyphers are sufficient.
One Example more.   *Example 3.*

Reduce 3 Farthings to the Decimal of a Pound, that is
$\frac{3}{960}$ vulgarly, 960 Farthings being a Pound, and therefore
so express'd, and with the same Reason as 9 Pence before,
240 Pence being a Pound.

96|0) 300000|0 (,003125.   The Work being performed
one according to the Division, with ~~two~~ Cyphers prefixed,
quotes, ,003125, or 3125 Hundred Thousand Parts of a
Pound ———— By the same Method, the Vulgar Fractions
of Weight, Measure, &c. are reduced to Decimals.

Example 4.

How is 12 Pounds Weight expressed in the Decimal of
1 C. Weight *Averdupois*, or 112 *lb.* the Vulgar Fraction
is $\frac{12}{112}$, and the Decimal, 1071 found as before, thus,

112) 120000 -(,1071

          112
          ——————   The Remainder 48 is not
                     worth Notice, being less than the
          &c.   10000th Part of Unit, or 1.

Example. 5.

How is 73 Days brought to the Decimal of a Year,
vulgarly thus expressed $\frac{73}{365}$.

365)730(,2 *Ans.* 2 tenths.   *Thus proved,*
     730

     ——————
       o

Here 365, the Days in a Year, is divided by 10, twice,
and the Quotients added together, and they make 73 Days

Valuation of Decimals.

TO find the Value of a Decimal Fraction, whether of Coin, Weight, Measure, &c.

Rule. Multiply the Decimal given by the Units contain- ed in one of the next inferior Denomination, and point off as many Places from the Right-hand as you have in your Decimal; so those Figures toward the Left of those point- ed off, are Integers, or Whole Numbers; and those on the other Side toward the Right-hand, are Parts of 1 or Unity; that is, so many Tenths, Hundredths, Thousandths, or Ten Thousandths of one of those Integers, whether a Pound, Shiling, or a Penny, &c. or of a Tun, a Hundred, a Quarter, or a Pound Weight, &c. And so of any other Integer, of what Kind or Quality soever.

Examples.

,476 Parts of a Pound Sterling,
20 Shillings a Pound.

9,520
12 Pence 1 Shilling.

Answer.   6,240
d. 6*d.* 960   4 Farthings 1 Penny.
Parts or ¼
of a *d.*   ,960 Parts of a *f.* or almost ¼ of a *d.*

,476 Parts of a T~~un~~ wt. *Ton*
20 C. 1 T~~un~~. *Ton*

9,520
4 *qrs.* 1 C.

2,080
28*l.* 1 *qr.* of a C.

Answer,
C. 2 *qrs.* 2 *lb.* 240 *parts.* ——
2,240

In the Example of Money, I multiply the Fraction by , and point off 520 for the three Places in the Decimal, &c. and the Answer is 9 *s.* 6 *d.* ¼.

In the Example of Weight, I proceed as in that of Mo- ney (the Fraction being the same) but with different Re-

H 3   spect

fpect to the inferior Denominations ; and the Anfwer is 9 C. 2 *qrs.* 2 *lb.* $\frac{240}{1000}$ of a Pound Wt.

To find the Value of a Decimal in Money in a briefer Method, *viz.*

Rule. Always account the double of the firft Figure (to the Left hand) for Shillings ; and if the next to it is 5, reckon ; and whatever is above 5, call every One, Ten ; and the next Figure fo many Ones as it contains ; which Tens and Ones call Farthings ; and for every 25, abate one : As admit the laft Example of Money, *viz.* 476 ; the double of 4 is 8 ; and there being one five in 7, (the next Figure) I reckon 1 *s.* more, which make 9 *s.* and there being 2 in 7 above 5, they are to be accounted two Tens, or 20 ; which with the next Figure 9 being fo many Ones, make 26 Farthings ; and abating 1 for 24, give 6 *d.* and almoft a Farthing more, for the Fraction 960 Thoufandths of a Pound is within 40 of a Farthing.

Addition of Decimals.

IS the fame in Practice as in whole Numbers ; only in fetting down, Care muft be taken that the Decimal Parts ftand refpectively under their Parts ; that is, Primes under Primes, Seconds under Seconds, Thirds under Thirds, &c. and the Integers ftand as in whole Numbers.

Example.

Integers	Primes	Seconds	Thirds		Parts				Primes	Seconds	Thirds	Fourths	Fifths
2 4 6	,4	2	6		,4	7	9	6	,4	7	9	6	2
7 4	,4	2			,4	2			,0	6	4	2	
9	,0	6			,0	7	6		,0	0	6		
6 5	,7	9	4		,0	0	0	4	,7				
4 2	,0	0	5		,5				,9				
4 3 7	,7	0	5		1 ,4	7	6	0	2 ,1	4	9	8	2

Note, *There muft be as many Places pointed off, as there are in the biggeft Number.*

The cafting up of the foregoing Examples is the fame with Addition of one Denomination in Whole Numbers: The Total of the firft (fuppofing them Pounds Sterling) is 437 *l.* and ,705 Parts. The fecond is 1 *l.* and ,4760 Parts. And the third is 2 *l.* and ,14982 Parts.

Subtraction of Decimals.

THE Numbers muſt be placed as before in *Addition*, and then proceed as in *Subtraction of one Denomination of Numbers*

Examples.

l. pts.	l. pts.	l. pts.
46,51	140,42	4762,0
9,24	91,7462	0,472
37,27	48,6738	4761,528

Multiplication of Decimals.

HERE the placing the Numbers and Operation is the very ſame as in Whole Numbers ; and only to remember to point off towards the Right-hand ſo many Places for Decimals as you have Decimal Places in both *Multiplicand* and *Multiplier.*

Examples.

(1.)	(2.)	(3.)
24,6	4602	,2796
2,5	,075	26
1230	23010	16776
492	32214	5592
61,50	345,150	7,2696

(4)	(5)	(6)
,07214	,083	4,25
,006	,16	1,09
,00043284	498	3825
	083	4250
	,01328	4,6325

Note, That where there are not a competent Number of Figures, or Places to point off, ſuch Defect is ſupplied with Cyphers to the Left-hand ; as in the 4th and 5th Examples, according to what was before hinted in reducing a Vulgar Fraction to a Decimal.

H 4 *Divi-*

Division of Decimals.

IS the same in Operation as in whole Numbers : The only Difficulty is to know how many Decimal Places to point off towards the Right-hand of the Quotient: to which end, remember this Rule : Observe how many Decimal Places there are, both in the Divisor and Dividend, and note the Difference ; and whatsoever it is, so many Places must be pointed off to the Right-hand of the Quotient.

Examples.

Divide 12,345670 by 6,789) 12,345670 (1,818
6789 · · ·
_____

In this Example, the Dividend hath three Decimal Places more than the Divisor, wherefore I point off three Places to the Right-hand of the Quotient, *viz.* 813 ; so the Quotient is 1 Integer, and ,818 Parts.

55566
54312
_____

12457
6789
_____

57580
54312
_____

(3268)

Divide 3,46000 by 1,23) 3,46000 (2,813
246 · · ·
_____

Here the Difference between the Divisor and Dividend is three Places ; as in the foregoing Example ; therefore ,813 is pointed off for the Decimal Fraction ; and the Quotient is 2 Integers, and ,813 thousandths of an Integer, or 1.

1000
984
_____

160
123
_____

370
369
_____

(1)

Thus much for Fractions Vulgar and Decimal ; wherein I have been as concise as possible, and worked with as much Plainness as I could invent.

BOOK-KEEPING.

THE next Qualification to fit a Man for Bufinefs, after *Arithmetick*, is the Art of *Book-keeping*, or *Merchants-Accompts*, after the *Italian* Manner, by way of Double Entry.

It is not without good Reafon that moft People of Bufinefs and Ingenuity, are defirous to be Mafters of this Art : For if we confider the Satisfaction that naturally arifeth from an Accompt well kept ; the Pleafure that accrues to a Perfon by feeing what he gains by each Species of Goods he deals in, and his whole Profit by a Year's Trade ; and thereby alfo, to know the true State of his Affairs and Circumftances ; fo that he may, according to Difcretion, retrench or enlarge his Expences, &c. as he fhall think fit.

This Art of *Book-keeping*, or *Merchants-Accompts*, is talked of by many, but truly underftood but by very few: For every petty School-Mafter in any By-Corner, will be fure to have *Merchants-Accompts* expreffed on his Sign, as a principal Article of his Ability in Teaching ; though, ftrictly fpeaking, for want of the Practical Part, knows hardly any Thing of the Matter, and confequently uncapable of teaching it.

Inftructions, Notes, Rules, and Directions for the right ordering and keeping *Merchants-Accompts*, by the excellent Order of Charge and Difcharge, commonly called *Debtor* and *Creditor*.

Of the Books in Ufe.

THE Books of principal Ufe, are the *Wafte-Book*, (or by fome called the *Memorial*) *Journal*, and *Leidger*.

Wafte-Book.

IN this Book muft be daily written whatever occurs in the way of Trade ; as Buying, Selling, Receiving, Delivering, Bargaining, Shipping, &c. without Omiffion of any one Thing, either bought or fold, &c. as Money lent, or received at Intereft : But not Money received or paid for Goods fold or bought at Times ; for that will come of Courfe, and muft be entered into the *Cafh-Book*, from whence it is pofted into the *Leidger*.

The *Wafte-Book* is ruled with one Marginal Line, and three Lines for Pounds, Shillings, and Pence ; and the

Day

Day of the Month, and Year of our Lord, is inserted in the Middle of the Page. In this Book any one may write, and, on occasion, any thing may be blotted out, if not well entered, or any Error be made.

JOURNAL.

INTO this Book every thing is posted out of the *Waste-Book*, but in other Terms, in a better Stile, and in a fairer Hand, without any Alteration of Cyphers or Figures; and every Parcel, one after another (promiscuously set) without Intermission, to make the Book, or several Entries of it, of more Credit and Validity, in Case of any Law Dispute, or any other Controversy that may happen between Merchant and Merchant. In this Book you are to distinguish the Debtor and Creditor (or in quainter Terms, the *Debit* and *Credit*.) And to this Book you must have Recourse for the Particulars of an Accompt, which in the Leidger are enter'd in Gross, that is, in one Line. In this Book also, the Day of the Month must be placed in the Middle of the Page; and is ruled with double Marginal Lines, for References to the Leidger; and with three Lines for *l. s. d.* as the Waste Book.

Of the Leidger.

FROM the *Journal* or *Day-Book* (as derived from the *French*) all Matters or Things are posted into the *Leidger*, which by the *Spaniards* are called *Ellibro Grande*, as being the biggest Book, or chief of Accompts. The Left-hand Side of this Book is the *Debtor*, and the Right the *Creditor*; and the *Numbers* and *Folios* of each Side must be alike, as 45 *Debtor*, and also 45 *Creditor*. The Day of the Month (in this Book) by most is set in a narrow Column on the Left-hand, and the Month on the Left of that: But where I kept Books, the Number in the narrow Column referr'd to the Journal Page, and the Month and Day was placed in the broad Column, to the Right of that; and at the Head of each Folio is the Name of the Place of Residence, and the Year of our Lord; as thus:

London, Anno —————————————1741.

But the Examples of these several Books hereafter following, will make the foregoing Hints of them much more intelligible.—And as I am upon the Doctrine of Book-keeping, I'll take this as an universal Text (for so it is) *viz.*

All Things received, or the Receiver, are Debtors to the Delivered, or the Deliverer.

	l.	*s.*	*d.*
Waste-Book Entry.			
London, *January* 1, 1741.			
Bought of *William Wilkins,* of *Norton Falgate,* 120 Yards of white Sarcenet, at 2 *s.* 3 *d. per* Yard, to pay in 2 Months ——— ———	13	10	—
The Journal Entry of the same.			
Wrought Silk, Debtor to *William Wilkins l.* 13—10 for 120 Yards of white Sarcenet, at 2 *s.* 3 *d. per* Yard, to pay in 2 Months ——— ———	13	10	—
In this Example, the Account of Wrought Silks is the Receiver, and therefore Debtor to William Wilkins *the Deliverer.*			
Again,			
Waste-Entry Book.			
January 4.			
Sold *Henry Hartington* 246 lb. nett of Indico Lahore, at 6 *s.* 6 *d. per* lb. to pay at 3 Months ——— .	79	19	—
Journal Entry.			
Henry Hartington Dr. to Indico, for 246 lb. nett, at 6 *s.* 6 *d. per* lb. to pay in 3 Months ——— ———	79	19	—
Once more.			
Waste-Book Entry.			
Bought of *George Goodinch,* Sen. *viz.*			
Chesh. Cheese 430 C. ½, at 23 *s.* 4 *d. per* C. } *l.* 502-5			
Butter, 50 Firkins, qt. nett 2800 lb. at 3 *d. per* lb. } 35-0			
to pay at 6 Months ———	537	05	—
Journal Entry.			
Sundry Accounts Dr. to *Geo. Goodinch, l.* 537—05——— *viz.*			
Cheese of *Cheshire,* for 430 C. ½, 23 *s.* 4 *d. per* C. } *l.* 502-5			
Butter, for 50 Firkins, qt. nett 2800 lb. at 3 *d. per* lb. } 35-0	537	05	—

Waste Book.

		l.	*s.*	*d.*
So'd *James Jenkins*,—viz.				
White Sarcenet 50 Yards at 3 *s. per* Yard	7–10–0			
Indico Lahore 50 Pounds, at 7 *s. per* Pound	17–10–0			
		25	—	—

Journal Entry of the last.

6	*James Jenkins* Debtor to sundry Accounts, *viz.*			
7	To white Sarcenet for 50 Yards, at 3 *s. per* Yard ——— ——— *l.* 7–10–00			
8	To Indico Lahore for 50 *lb.* at 7 *s. per ib.* — 17–10–00			
		25	—	—

From these few Examples of Entry, it may be observed, that an experienced Person in Accompts, and a good Writer, may keep a *Journal* without a *Waste-Book*, or a *Waste-Book* without a *Journal*, since they both import one and the same thing, though they differ a little in Words, or expressing: For the Leaves of both are numbered by Pages, or Parcels as some do.

But however, I shall give Methods of keeping each as far as Room will give me Leave.

(1)

The Waste-Book.

London, January 1*st,* ——————— 1741.

An Inventory of all my Effects of Money, Goods, and Debts, belonging to me A. B. *of* London, *Merchant*, viz.

In Cash for trading Occasions

		l.	*s.*	*d.*
		3500,—,—		
In Tobacco 4726 *lb.* at 9 *d. per lb.*	177, 4, 6			
In Broadcloth 6 Pieces, at 50 *s. per* Piece ———	15,—,—			
Dowlas 1000 Ells, at 2 *s.* 4 *d. per* Ell ———	116,13, 4			
Canary Wines 9 Pipes at 30 *l. per* Pipe ———	270,—,—			
Due to me from *Henry Bland, per* Bond ———	60,—,—			
		4138	17	10

(1)
Journal.
Inventory, &c. as above.

			l.	*s.*	*d.*
	Sundry Accts. Dr. to Stock — 4138,17;10				
1	*viz.*				
1	Cash for Trading Occasions	3500,--,--			
	Tobaccoes 4726 *lb.* at 9 *d. per* lb.	177, 4, 6			
1	Broadcloths 6 Pieces, at 50 *s. per* Piece	15,—,—			
1	Dowlas 1000 Ells, at 2 *s.* 4 *d. per* Ell	116,13,4			
1	Canary Wines 9 Pipes, at 30 *l. per* Pipe	270,—,—			
3	*Henry Bland* due on Bond—60,—,—				
			4138	17	10

I shall make one Page serve both for Waste-Book and Journal Entries, to save room, and also to have both Methods of Entry under Eye, to make them more intelligibly useful to the Reader, he hereby being not obliged to turn over Leaf to see their Difference of Entry.

1	*Waste-Book.*				

London, *January* 1*st,*————1741.

			l.	*s.*	*d.*
	Owing to *William Webb*, by Note of my Hand	50 — —			
	Ditto to *Roger Ruff*, to Balance his Account	16 12 4			
	Ditto to *Henry Hern*, due the 4th of *May* next	62 — —			
			128	12	4

Journal.

			l.	*s.*	*d.*
1	Stock Debtor to sundry Accounts, *l.* 128—12—4 —— *viz.*				
3	To *William Webb*, by Note of my Hand	50 — —			
4	To *Roger Ruff* for Balance of his Account	16 12 4			
5	To *Henry Hern*, due the 4th of *May* next	62 — —	128	12	4

Waste-.

Waste-Book.   2

London, Febr. 2d. ———————————— 1741.

	l.	s.	d.
Sold *Thomas Townsend*; *viz.*			
246 *lb.* of *Virginia*-Cut To-bacco, at 14 *d. per lb.* } 14 07 —			
460 Ells of Dowlas, at 3 *s. per* Ell ——— } 69 — —			
	83	07	—

Feb. 2.
Journal.

		l.	s.	d.
6	*Thomas Townsend*, Debtor to Sundries, *viz.*			
1	To Tobacco, for 246 *lb.* at 14 *d. per lb.* ——— } 14 07 —			
1	To Dowlas, for 460 Ells, at 3 *s. per* Ell ——— } 69 — —			
		83	07	—

Waste-Book.
Ditto 24th.

Bought of *Leonard Legg*, 4 Pipes of Canary, at 28 *lb. per* Pipe ———	112	—	—
To pay in 6 Months.			

Ditto 24th.
Journal.

1	Canary Wines, Debtor to *Leonard Legg* for 4 Pipes, at 28 Pounds *per*			
2	Pipe ———————————	112	—	—
	To pay in 6 Months.			

The short Lines ruled against the Journal Entries are, or may be, termed Posting Lines, and the Figure on Top of the Lines denotes the Folio of the Ledger where the Debtor is entered; and the Figure under the Line shews the Folio of the Leidger where the Credit is entered; and the other smaller Figures against the sundry Debtors, or sundry Creditors (whether Goods or Persons) shew also in what Folios of the Leidger they are posted. And the Figures in the narrow Column toward the Left-hand of the Pounds, Shillings, and Pence Lines, direct to the Folio in the Leidger where the Debit or Credit is posted;

ed'; that is, to the Accompt of Goods, or of the Perfon immediately following the Words *To* or *By*; the firft being proper to the Left or Debit Side in the Leidger; and the other ufed always on the Right or Credit Side of the Folio's in the Leidger.

There are feveral other Books ufed by Merchants befides thofe three before-mentioned; as the *Cafh-Book*, which is ruled as the Leidger, and folio'd l kewife, wherein all Receipts of Money are entered on the Left-hand Folio, and Payments on the Right; fpecifying in every Entry the Day of the Month (the Year being fet on the Top) for what, and for whofe Account the Money was received, or paid; and the Total Debit and Credit of each Side, is to be pofted into the Leidger, to the Accompt of Cafh therein, in one Line of either Side, *viz.* to, or by fundry Accompts, as *per* Cafh-Book, Folio, &c. which is to be done once a Month, or at Difcretion; and the Part.cu'ars of each Side, Article by Article, are to be pofted into the Leidger to the proper Accompts unto which they be ong; with References in the Cafh Book to the feveral Folio's in the Leidger; and carry the Balance over Leaf in the Cafh Book; by which you may know at any time what Cafh you have, or ought to have by you.

Another Book, is a Book of Charges of Merchandize, wherein is to be entered the Cuftom and petty Charges of any fhipp'd Goods; as Porterage, Wharfage, Wharehoufe room, &c. and once a Month is tranferred into the Cafh-Book on the Credit Side, making Reference to the Book of Charges of Merchandize; and likewife the fame in the Debtor Side of the fame Accompt in the Leidger for the Particulars thereof.

The next Book I fhall name, is the Invoice Book, or Book of Factories: In this Book is to be copied all Invoices or Cargozones of Goods fhipp'd, e.ther for Accompts proper or partable; and alfo of Goods received from Abroad, which muft always be entered on the Left-fide, leaving the Right-fide Blank; and on the Advice of the Difpofal of Goods fent Abroad, and alfo on the Sale of Goods received from Abroad, enter them on the Blank or Right-fide; fo at firft View may be feen how the Accompt ftands, &c.

The next a Bill-Book, wherein is entered Bills of Exchange accepted, and when they become due; and when paid, made fo in the Margin.

The

The next is a Book of Houfhold Expences, for the Monthly Charge fpent in Houfe-keeping ; likewife Apparel, Houfe-rent, Servants Wages, and Pocket-Expences ; and this may be monthly fummed up, and carried to the Credit of Cafh.

Befides the above-mentioned, there muft be a Book to copy all Letters fent Abroad, or beyond the Seas ; wherin the Name of the Perfon or Perfons to whom the Letter is fent, muft be written pretty full, for the readier finding the fame.

The next is (and what is very neceffary) a Receipt Book, wherein is given Receipts for Money paid, and expreffed for whofe Accompt or Ufe, or for what it is received ; to which the receiving Perfon muft fet his Name for him-felf, or fome other, with the Year and Day of the Month on the Top.

Laftly, A Note or Memorandum-Book, to minute down Affairs that occur, for the better help of Memory ; and is of great Ufe where there is Multiplicity of Bufinefs.

Having given an Account of the feveral Books and their Ufe, the next Thing neceffary will be, to give fome few Rules of Aid, to enable the Book-keeper to make proper Entries, and to diftinguifh the feveral Debtors and Creditors, *viz.*

Firft, For Money received, make Cafh Dr. to the Party that paid it (if for his own Accompt) and the Party Cr.

Secondly, Money paid, make the Receiver Dr. (if for his own Accompt) and Cafh Cr.

Thirdly, Goods bought for ready Money, make the Goods Dr. to Cafh, and Cafh Cr. by the Goods.

Fourthly, Goods fold for ready Money, juft the contrary, *i. e.* Cafh Dr, and the Goods Cr.

Fifthly, Goods bought at Time ; Goods bought are Dr. to the Seller of them, and the Seller Cr. by the Goods.

Sixthly, Goods fold at Time, juft the contrary, *i. e.* the Party that bought them is Dr. to the Goods, and the Goods Cr. by the Party.

Seventhly, Goods bought, part for ready Money, and the reft at Time : Firft, make the Goods Dr. to the Party for the whole, Secondly, make the Party Dr. to Cafh for the Money paid him in part of thofe Goods.

Eighthly, Goods fold, part for ready Money, and the reft at Times : Firft, make the Party Dr. to the Goods for the whole.

3

whole. Secondly, Cafh Dr. to the Party recei.ved of him in part of thofe Goods.————————Or either of thefe two la.t Ru es may be made Dr. to Sundries ; as Goods bought, Dr. to the felling Man for fo much as is left unpaid, and to Cafh for fo much paid in ready Money : And fo on the con- trary for Goods fold.

Ninthly, When you pay Money before it is due, and are to have Difcount allowed you, make the Perfon Dr. to Cafh for fo much as you pay him, and to Profit and Lofs for the Difcount ; or make the receiving Man Dr. to Sun- dries, as before.

Profit and Lofs is Dr.

To Cafh for what Money you pay and have nothing for it, as Difcount of Money paid you before due, and to A- batemei.t by Compofition, Houfhold Expences, &c.

Per Contra ~~Dr.~~ *Cr.*

By Cafh for all you receive, and deliver nothing for it ; as Difcount for Prompt Payment, any Legacy left you, Money received with an Apprentice, and by the Profit of every particular Commodity you deal in, by Ships in Com- pany, by Voyages, &c.

To balance or clear an Accompt when full written.

FIRST, if the Dr. Side be more than the Credit, make the Old Accompt Cr. by the New ; and if the contrary, make the New Accompt Dr. to the Old : But if the Dr. Side be lefs than the Credit, then make the Old Accompt Dr. to the New, and the New Accompt Cr. by the Old, for fuch a Reft or Sum as you fhall find in the Accompt.

2. An Accompt of Company, wherein you have placed more receiv'd of another than his Stock ; then add as much on the Debit Side as you find on the Credit Side ; to the end that, in the new Accompt, you may have fo much Debit as you put in, and fo much Credit as you have re- ce.ved.

3. In Accompts of Merchandize, you muft enter the Gain, or Lofs, before you make the Old Accompt Cr. by the New, and the New Dr. to the Old, for the Remainder of Goods unfold.

4. In the Foreign Accompts, which you are to keep with a double Margin, or Column, for Dollars, Growns, or any foreign Co.ns whatfoever, which have been received or
paid

paid by Bills of Exchange for Goods fold by Factors or Correspondents, or bought by them for the Accompt before; here you muft firft balance the faid inward Margin of Dollars, Crowns, &c.

To remove an Account full written to another Folio.

Sum or add up the Dr. and Cr. Sides, and fee the Difference, which place to its oppofite : As admit the Cr. Side exceeds the Dr. then you are to write the Line in the Old Accompt to balance on the Dr. Side, to anfwer the Line on the Cr. Side of the New Accompt.

How to balance at the Year's End, and thereby to know the State of your Affairs and Circumftances.

YOU muft make an Accompt of Balance on the next void Leaf or Folio of your Leidger to your other Accompts ; but after fo done, do not venture to draw out the Accompt of Balance in the faid Folio, 'till you have made it exact on a Sheet of Paper, ruled and titled for that Purpofe; becaufe of Miftakes or Errors that may occur or happen in the Courfe of balancing your Leidger ; which are to be rectified, and will caufe Erafements or Alterations in that Accompt, which ought to be very fair and exact ; and after you have made it to bear in the faid Sheet, Copy fair the faid Accompt of Balance in the Leidger.

The Rules for balancing are thefe, *viz.*

1*ft*, Even your Accompt of Cafh, and bear the Nett Reft to balance Dr

2*dly*, Caft up all your Goods bought, and thofe fold, of what Kind foever, in each Accompt of Goods ; and fee whether all Goods bought, be fold or not ; and if any remain unfold, value them as they coft you, or according to the prefent Market Price, ready Money ; and bear the Nett Reft to balance Dr.

3*dly*, See what your Goods or Wares feverally coft, and alfo how much they were fold for, and bear the Nett Grain or Lofs to the Accompt of Profit and Lofs.

4*thly*, Even all your Drs. and all your Crs. in order as they lie, and bear the Nett Reft of feveral Dr. and Cr. to balance.

5*thly*, Even your Voyages, your Factors Accompts, wherein is either Gain or Lofs, and bear the Net Gain or Lofs to the Accompt of Profit and Lofs ; and the Goods unfold to balance.

6*thly*,

6thly, Even the Accompt of Profit and Loſs, and bear the Nett Reſt to Stock or Capital, as an Advance to your Stock or Capital.

7thly, Even your Stock, and bear the Nett Reſt to balance Cr.

Then caſt up the Dr. and Cr. Sides of your Balance ; and if they come out both alike, then are your Accompts well kept ; otherwiſe you muſt find out your Error by pricking over your Books again, to ſee whether you have entered every Dr. and Cr. in the Leidger as you ought.

Note, *By pricking over the Book is meant, an examining every Article of the Journal, againſt the Leidger, and marking it thus, — or thus † ; and upon the ſecond Examination thus ‡ ; and upon a third Examination thus ‖, or any other Mark.*

Note alſo, *In all Accompts of Goods you muſt keep a Column in the Middle of the Leaf, of each Side, for Number, Weight or Meaſure.*

And alſo Note, *That the Money, Wares, or Goods remaining in your Hands, and the Debts owing to you, muſt ever balance with the Nett Stock and Debts owing by you.*

Though all that hath been ſaid in relation to Book-keeping, and the ſeveral Rules thereunto belonging, may ſeem a little abſtruſe to the altogether Unlearned therein, yet there is no ſuch mighty Difficulty to inſtruct them as they may imagine : For, theſe following Hints may render what hath been already ſaid, intelligible to an ordinary Capacity.

1ſt, Stick cloſe to the Text, or General Rule beforementioned, *viz.* That all Things received, or the Receiver, are Debtor to all Things delivered, or the Deliverer ; for this Rule holds good in all Caſes.

2dly, When the Dr. (whether Perſon or Goods) is known, the Cr. is eaſily underſtood, without mentioning it : For if *A* be Dr. to *B*, then *B* is Cr. by *A*, for what Sum ſoever it be : Alſo, if Goods be Dr. to *C*, then *C* is Cr. by thoſe Goods, for the Sum they amount to.———This I mention, becauſe that in moſt Authors (if not all) that I have met with on the Subject of Book-keeping, ſpend a great many Words, which I think (begging their Pardon if I err) might be ſaved, in declaring the Creditor, as well as ſhewing the Debtor, when it may be underſtood, as aforeſaid.

3dly,

3*dly*, This Art of *Italian* Book-keeping, is called *Book-keeping by Double Entry*, becauſe there muſt be two Entries; the firſt being a Charging of a Perſon, Money, or Goods; and the ſecond a Diſcharging of a Perſon, Money, or Goods.

4*thly, Strictly note*, That if the firſt Entry be on the Dr. or Left-hand Side of your Leidger; the next or ſecond Entry, muſt always be made on the Right or Credit Side of your Leidger; for whenever one Perſon or Thing is charged, then always another Perſon or Thing is diſcharged for the ſaid Sum, let it be what it will.

And ſo it is in balancing or evening an Accompt, and carrying it to another Folio; for if the old Accompt be evened by Balance on the Credit Side, then the new Accompt muſt be debited or charged on the Debit Side, for the Sum that balanced the old Accompt.

Much more might be ſaid to this *Art of Book-keeping*, if I had Room; but I have plainly ſpoke to the principal Fundamentals thereof, which I hope may be ſufficient for the Inſtruction and Improvement of any Intelligent Reader.

The next Matter I ſhall go upon, is to ſhew, or give Examples of various Kinds of Receipts, and promiſſory Notes; alſo Bills of Parcels in different Trades; likewiſe Bills of Book-Debts, Bills of Exchange, with Remarks on them; and ſome other Preſidents of Writings in Trade and Mercantile Affairs.

And firſt of Receipts of different Forms.

l.   s.   d.

Received *September* 23, 1741, of Mr.
Anthony Archer, the Sum of Six
Pounds Nine Shillings; I ſay received for } 6—09—00
my Maſter *Bryan Burry*, *per me*

> *Caleb Catchmoney.*

London, September 23, 1741.
Received of Mr. *Kendrick Keeptouch*
Ten Pounds Eleven Shillings and } 10—11—06
Six Pence, in full Payment, *per me*

> *Henry Haſty.*

Note, *The Sum received muſt always be expreſſed in Words at length, and not in Figures, in the Body of the Receipt; but it may, and ought to be expreſſed in Figures behind a Brace (as in the two foregoing Examples) as well as in the Body of the Receipt.*

Whea

When a Receipt is given in a Book, there is no Occasion to mention the Man's Name of whom you receive the Money; because that is implied, he being the Owner of the Book.

A Receipt in part of Goods sold.

	l.	s.	d.

Received the 24th of *September*, 1741, of Mr. *Timothy Truſtlittle*, Fifty Pounds in Part of *Indico* ſold him the 22d Inſtant, per me

50—00—00

Laurence Lovemony.

A Receipt given in a Receipt Book.

Received the 26th of *September*, 1741, the Sum of Forty-five Pounds, by the Order, and for the Accompt of *George Greedy*, Eſq; per

45—00—00

Timothy Truſty.

Received the 27th of *September*, 1741, of Mr. *Daniel Davenport* and Company, One hundred Pounds, on Accompt of ſelf and Partner, per

100—00—00

James Jenks.

Received the 28th of *September*, 1741, of Mr. *Peter Punctual*, Fifty-five Pounds Sixteen Shillings and Nine Pence, in part for Tobacco ſold him the 24th of *Auguſt* laſt, per

55—16—09

Fabian Funk.

Received the 29th of *September*, 1741, of the Honourable *Eaſt-India* Company, Three hundred and fifteen Pounds Ten Shillings, per Order, and for the Accompt of *Peter Pepper*, per

315—10—00

Stephen Storax.

Received *October* 2, 1741, of the Governor and Company of the Bank of *England*, One thouſand ſix hundred Pounds Ten Shillings, for Self and Company, per

1600—10—00

Leonard Longpurſe.

Re:

	l.	s.	d.

REceived the 5th of *October*, 1741, of the Worshipful Company of *Grocers*, Forty-nine Pound Fifteen Shillings, in full Payment for my Father *Peter Plumb, per* me   49—15—00

          Peter Plumb, junior.

REceived the 6th of *Octob.* 1741, of the Right Honourable Sir *Robert Godschall*, Knt. Lord Mayor of *London*, the Sum of Sixty Pounds, for the Use of the Worshipful Company of *Haberdashers, per*   60—00—00

        Caleb Careful, Clerk.

A Rent Gatherer's Receipt.

REceived the 24th of *October*, 1741, of Mr. *Aaron Arable*, Twenty-five Pounds, in full for half a Year's Rent, due at *Michaelmas* last, and deducted for Taxes five Pounds, and for Repairs Two Pounds. together Seven Pounds; I say received for the Use of *Laurence Letland*, Esq; by Virtue of his Letter of Attorney, *per*   25—00—00

        Robert Rentrole.

REceived of Mr. *Timothy Tennant*, this 25th Day of *October*, 1741, Six Pounds for a Quarters Rent, due at *Michaelmas* last, for my Master *Lancelot Letfarm, per* me   6—00—00

        Francis Faithful.

REceived *August* 14, 1741, of Mr. *Peter Bishop*, Twenty nine Pounds Six Shillings, in part of a Bill of Sixty Pounds, due the 3 of *Xber* next, to Mr. *Sampson Shuffle, per*   29—06—00

        Francis Fidell.

A Receipt on the Back of a Bill of Exchange.

SEptember 30th, 1739, received the full Contents of the within mentioned, being 500 Pieces of Eight, *per*   500 *Pcs. of 8*

        Nathan Needy.

Promissory Notes.

I Promise to pay to Mr. *Timothy Teazer*, Sixty Pounds, on the 20th of this Instant *September*; witness my Hand this 15th of *September*, *Anno* 1741,

<div align="right">

Daniel Dilatory.

</div>

l. 60—00—00

October 18th, 1741.

I Promise to pay to the Honourable the Directors of the *South-Sea* Company, or bearer, on Demand, Four hundred Fifty Pounds, for my Father *James Jones*,

<div align="right">

William Jones.

</div>

l. 450

24th of October, 1741.

I Promise to pay unto the Governor and Company of the Bank of *England*, Two thousand Pounds,

<div align="right">

Nahum Neednothing.

</div>

l. 2000

October 24th, 1741.

I Promise to pay to the *Royal African* Company, or Bearer, on Demand, Seven hundred fifty-six Pounds Ten Shillings and Nine Pence, for My Master, *Robert Regular*,

<div align="right">

Lewis Marting.

</div>

l. 756—10—9

October 25, 1741.

I Promise to pay to the Honourable *East-India* Company, or Bearer, Five hundred Pounds, for *Henry Hudson*,

<div align="right">

Martin Moneybag.

</div>

l. 500

26th October, 1741.

I Promise to pay to Mr. *Christopher Cash*, five Pounds for Value received; witness my Hand this 26th Day of October, 1739.

<div align="right">

Robin Ruck

</div>

l. 5—00—0

<div align="right">

A

</div>

A Note given by Two.

WE, or either of us, promise to pay to Mr. *Matthew Mistrust*, or his Order, Six Pounds Sterling, on Demand, for the Value received : Witness our Hands this 27th of *September*, 1736,

l. 6—00—00

Nathen Needy *Samuel Surety*

Witness Nicholas Notice.

A Bill of Debt.

MEmorandum, That I *William Want*, of *London*, Weaver, do owe and am indebted unto Mr. *Timothy Trust*, of *Westminster*, Watchmaker, the Sum of Twenty-five Pounds Six Shillings of lawful Money of *Great Britain*, which Sum I promise to pay to the said *Timothy Trust*, his Executors, Administrators, or Assigns, on or before the 10th Day of *December* next ensuing : Witness my Hand this 22d Day of *October*, 1736,   *William Want*
Witness, Titus Testis.

Bill of Parcels.

IT is usual when Goods are sold, for the Seller to deliver to the Buyer, with the Goods, a Bill of Parcels; which is a Note of their Contents and Prices, with a Total of their Value cast up, *&c.*————These Bills ought to be handsomely writ, and in methodical Order, according to the best and customary Way of each particular Trade.

I shall therefore shew the Forms of Bills of Parcels in some Trades and Professions, with the shortest Methods of casting up the several Articles in each Bill.

A Mercer's Bill.
London, September 26, 1741.

Bought of *Abel Atlas*, and *Ben Burdett*, viz.

12 Yds ¾ of rich flowered Sattin, at 12 *s.* 6 *s. per* Yd.
8 Yds of sprig'd Tabby, at 6 *s.* 3 *d. per* Yd.
5 Yds ¼ of Farrindon, at 6 *s.* 8 *d. per* Yd.
6 Yds of Mohair, at 4 *s.* 2 *d. per* Yd.
17 Yds ½ of Lutestring, at 3 *s.* 4 *d. per* Yd.

16—7—8

Sometimes the Money is paid presently, then the Receipt is made as follows :

Received the 26th of *September*, 1741, Sixteen Pounds even Shillings and eight Pence, in full of this Bill, for my Master *Abel Atlas*, and Company ; *per me*

<div align="right">*Francis Fairspoken.*</div>

A Woollen-Draper's Bill.
London, September 24, 1741.

Bought of *Benjamin Broadcloth*, 22d of *September*, 1741, viz.

<div align="right">s.   d.</div>

Yards of fine Spanish Black, at —— 18—4 *per* Yd.

Yds ⅓ of ditto, at ———————— 12—4 ditto

Yds ¼ of fine mixt Cloth, at ——— 15—9 ditto

6 Yds ¾ of Frize, at ———————— 3—6 ditto

Yds of Drap-de-berry, at ———— 13—5 ditto

Yds ⅞ of superfine *Spanish* Cloth, at—18—10 ditto

A Linnen-Draper's Bill.
September 26th, 1741.

Bought of *Marmaduke Muslin*, viz.

6 Ells of Doulas, at 1 *s.* 4 *d. per* Ell.

4 Ells of Lockram, at 1 *s.* 3 *d. per* Ell.

2 Ells ½ of Holland, at 3 *s.* 4 *d. per* Ell.

Piece of Cambrick, at 15 *s.*

5 Yds ½ of Diaper, at 1 *s.* 10 *d. per* Yd.

9 Yds ¾ of Damask, at 4 *s.* 3 *d. per* Yd.

Pieces of Muslin, at 18 *s.* 10 *d. per* Piece.

The several Articles of these Bills are purposely omitted being cast up, for the Exercise of the Reader in the Rules of *Practice* ; or by the Rules of *Multiplication of Money*, before shewn ; which indeed is the best Method of all, for the ready casting up the divers and sundry Articles contained in any Bill of Parcels whatsoever.

Example.

We'll take the last Article of the Woollen-Draper's Bill, *viz.* 5 Yds ⅞, &c. at 18 *s.* 10 *d. per* Yard.

5 ⅞	18—10	
	7	
l. 4—14—2		
16—5 ¾	8) 131—10	
Facit l. 5—10—7 ¾	16— 5 ¾	

In this Example the Price is multiplied by the Quantity, *viz.* 5 Yards ⅞, according to the Rules delivered in *Multi-*

<div align="center">I</div>

<div align="right">*plication*</div>

plication of Money ; and the Product by 5 is *l.* 4—14—2:
Then for the $\frac{7}{8}$ of a Yard, I multiply the Price of the Integer, *viz.* 18 *s.* 10 *d.* by the Numerator of the Fraction, *viz.* 7, and divide by the Denominator 8, and the Quotient is 16 *s.* 5 *d.* $\frac{3}{4}$, agreeable with the Rule spoke to in the Doctrine of Fractions.———— Which 16 *s.* 5 *d.* $\frac{3}{4}$ added to the Product of 18 *s.* 10 *d.* multiplied by 5, gives *l.* 5—10—7$\frac{1}{4}$ as in the Operation above.

A Grocer's Bill.

Bought of *Robert Raisin* and *Peter Plumb*, *October* the 4th, 1739, *viz.*

	C. qrs. lb.	l. s. d.
Sugar 2 Hhds qt ——	17—2—17	at 1—10—6 per C.
Raisins 3 Barrels ——	6—1—19	at 1—14—5
Tobacco 1 Hhd ——	4—0—12	at 4—19—4
Rice 1 Barrel ——	1—0—15	at 2—16—4
Pepper 1 Bag ——	1—3—19	at 3—12—4
Brimstone ——	2—1—19	at 1—19—1

A Hosier's Bill.

Bought of *Silvester Slipstocking*, *Octob.* 5th, 1741, *viz.*

5 Pair of Women's mixt Worsted Hose, at ———— 5 *s.* 7 *d.*
3 pr of Womens Silk Hose, at ———— 9 *s.* 4 *d.*
22 pr of Mens Woollen ditto, at ———— 3 *s.* 2 *d.*
8 pr of Womens ditto, at ———— 2 *s.* 2 *d.*
21 yds of Flannel, at ———— 1 *s.* 11 *d.*
8 pr of Thread Hose, at ———— 3 *s.* 4 *d.*

The best and most expeditious Way of casting up these several Articles is by the Methods shewn in *Multiplication of Money.*

A Fishmonger's Bill.

Bought of *Leonard Ling*, 6th of *October*, 1741.

3 C. of Haberdine, at ———— *l.* 7—10—6 per C.
1 $\frac{1}{2}$ of Ling, at ———— 8—12—6
1 C. $\frac{1}{2}$ of Stock-fish, at ———— 4—10—6
6 Barrels $\frac{1}{2}$ of white Herrings, ———— 3—10—2
1 Barrel of red Herrings ———— 2—12—6
95 dried Salmon, at ———— 0—01—2

The Amount of each Article is purposely omitted for the young Man's Exercise in *Arithmetic.*

Note, *Haberdine* or *Ling*, 124 is a Hundred: *Stock-fish* and *Herrings*, 120 *to the Hundred*, 1200 *to a Thousand*, and 12 *Barrels a Last.*

A Leatherseller's Bill.

Bought of *Henry Hide*, the 7th of *October*, 1741, *viz.*

		s.	d.	l.
15 Large oil'd Lamb Skins, at		1	5 ½ *per* Skin.	
13 Kipp of Goat Skins, at		3	4	
137 Allom'd Sheep Skins, at		1	3	
19 Calve-skins, at		4	3	
85 Oil'd Buck Skins, at		12	9	
10 Russia Hides, at		12	9	
60 Dicker of Hides, at	*l.* 15	11	6	

Note, 50 *Goat Skins make a Kipp*; *and other Skins, five score to the Hundred. A Dicker is* 10 *Hides or Skins; and* 20 *Dicker a last.*

A Pewterer's Bill.

Bought of *Andrew Antimony, October* the 7th, 1741, *viz.*

	l.	s.	d.
Hard Metal Dishes wt. 42 at 14 *d. per lb.*	2	19	—
1 Dozen of ditto Plates	0	17	—
1 Chamber-pot of ditto	0	4	—
1 Standish of ditto	0	4	—
2 Tankards of ditto	0	5	10
18 Best Spoons	0	4	6
Hard Metal Porringers	0	3	—
1 Salt of ditto	0	1	10
1 Set of Castors	0	10	—
	4	19	2

Examples of Casting.

22 pr of Woollen Hose,   42 *lb.* of Pewter, at 1—2
at 3 *s.* 2 *d. per* Pair.   7
     7 and 3   ————
                                                    8—2
  4—2—2   6
     3   ———
  ————   *Answer l.* 2—9—0
  3—6—6
  3—2 the odd Pair.
  ————
l. 3—9—8 *Ans.*

Bills

Bills on Book Debts.

A Woollen-Draper's Bill.

1741   Mr. *Francis Freeze*, Dr.

			s.	*d.*	
April 20	To 16 Yds ½ of Black Cloth, at ——————————18	3	*per* Yd.	*l.*
ditto 24	To 4 Yds ⅛ of Drap-de-berry, at ——————————15	6		
May 4	To 35 Yds of mixt Grey Cloth, at ——————————10	5		
17	To 9 Yards of fine ditto, at 17	3		
June 12	To 12 Yds ½ of fine Broad Cloth, at ——————————17	3		

If the Gentleman pays the whole Bill, then make the
Receipt, thus:

Received the 19th of *Octob.* 1741, of Mr. *Francis Frieze*, the Sum of Fifty-four Pounds, &c. in full ⎫ *l.*
of this Bill and of all Accompts, for my Master, ⎬ 54, &c.
David Draper; *per*   *Michael Measurewell.* ⎭

A Mercer's Bill.

1741   Madam *Dinah Dilatory*, Dr. to *Bryan Brocade*,
                         viz.

Yds.			*s.*	*d.*	
Mar. 16	To 16½ of flower'd Sattin, at ——14	9	*per* Yd.	
April 14	To 14 of Venetian Silk, at ——11	8		
ditto 16	To 99 of Mohair, at ——— 6	3		
May 16	To 14½ of flower'd Damask, at — 9	7		
June 7	To 5⅛ of Genoa Velvet, at ——21	6		
ditto 25	To ¾ of Lutestring, at ——————— 4	7		

If part of the Bill is paid, write thus:

Received of Madam *Dinah Dilatory*, ⎫
Twelve Pounds Ten Shillings in Part of ⎬ *l.*   *s.*   *d.*
Payment, for my Master, *Bryan Brocade*; ⎬ 12   10   00
per   *Henry Hunter.* ⎭

A Corn-chandler's Bill.

1741   Mr. *Robert Racer*, Dr. to *Lionel Livery*.

			s.	*d.*	
April 24	To 5 Quarters of Oats, at ——2	3	*per* Bush.
May 16	To 9 Bushels of Beans, at ——4	10	
June 19	To 7 Bushels of Bran, at ——1	10	
	To 19 Bushels of Oats, at ——1	11	
ditto 24	To 16 Bushels of Beans, at ——3	11	

A Tobacconist's Bill.

1741		Mr. *Francis Fume*, Dr. to *Richard Raisecloud*, viz.	*d.*
May	1	To 1 Hhd of Tobacco, qt. nett, 569 *lb.* at ——————————	10 $\frac{1}{2}$ per lb.
ditto	25	To 1 Box, qt. 75 *lb.* $\frac{1}{2}$ nett, at ———— 11 $\frac{3}{4}$	
June	4	To 5 Bags of Old *Spanish*, qt. nett, 671 *lb.* at ————————— 3 $\frac{1}{4}$	
July	12	To $\frac{1}{2}$ Hhd, qt. 334 Grofs, Tare 42, nett, 293 *lb.* at ————————— 5 $\frac{1}{4}$	
7ber	7	To 2 Roles of Tobacco, qt. 94 *lb.* at 9 $\frac{1}{8}$	

A Stationer's Bill.

1741		Mr. *Sifcera Scribler*, Dr. to *Phineas Foolfcap*, viz.			
		Reams	*s.*	*d.*	*l.*
July	12	To 57 of Demy Paper, at ———	5	9	per R.
ditto	31	To 195 of 2d Foolfcap, at ———	6	3	
Aug.	24	To 375 of 2d Demy, at ———	8	2	
7ber	6	To 95 of French Royal, at ———	9	6	
8ber	26	To 26 Roll's of Parchment, at ——— 15	11		

l. 331—18—5

Note, *A Roll of Parchment is* 60 *Skins: A Ream of Paper* 20 *Quires; and a Bale of Paper* 10 *Reams.*

A Bricklayer's Bill.

1741		Mr. *Martin Messuage*, Dr. to *Peter Pantile*, viz.
Mar.	27	To 25 Thoufand of Bricks, at 16 *s. per* M.
ditto	30	To 11 Thoufand Plain Tiles, at 20 *s.* 6 *d. per* M.
April	1	To 28 C. of Lime, at 12 *s. per* C.
ditto	9	To 20 Load of Sand, at 3 *s.* 6 *d. per* Load.
May	20	To 140 Ridge Tiles, at 8 *s.* 6 *d. per* C.
June	24	To 90 Days Work my felf, at 3 *s. per* Day.
		To 90 Days my Man, at 2 *s.* 6 *d.*
		To 90 Days another Bricklayer, at 2 *s.* 6 *d.*
		To 90 Days for 2 Labourers, at 20 *d.* a Day each.

Note, 1000 *plain* Tiles is 1 *Load;* and 25 *Bags or Bufhels of Lime* 1 C. *A Brick muft be* 9 *Inches long, and* 4 *Inches* $\frac{1}{2}$ *broad. Bricks are of three forts,* Plaice Bricks, Red and Grey Stock Bricks.—————

Here it is neceffary to give a general Rule for the cafting up any Thing fold by the Thoufand; as Bricks, Tiles, Clin-

kards,

kards, or *Flanders* paving Bricks, and several other Things mentioned in the Book of *Rates*, *viz.* Barrel Hoops, Goose Quils, Oranges and Lemons, Squirrel Skins, Billets, &c.

And the easy Rule is this, viz.

Multiply the given Number by the Shillings in the Price, (if the Price be at so many Shillings *per M.*) and always cut off three Figures or Places toward the Right-hand ; and the Figures toward the Left-hand are Shillings, which divide by 20, to bring them into Pounds : And those Figures separated towards the Right-hand, multiply by 12, the next inferior Denomination ; and still cut off, or separate three Places toward the Right-hand, and the Figures toward the Left are Pence ; and the three last Figures cut off, multiply by 4 ; and still separate three Places toward the Right-hand, and the Figures towards the Left are Farthings.————And if the Price be Shillings and Pence *per* Thousand, then reduce the Price into Pence, and multiply the given Number by the Pence contained in the Price, cutting off three Places toward the Right as aforesaid ; and the Figures toward the Left are Pence, which bring into Pounds, according to Rule; and multiply the Remainder, or Figures cut off, by 4, &c.

Example.

24650 Bricks, at 17 *s. per* Thousand.

17

172550
24650

Ans. Shillings 41,9|050 20 *l.* 19 *s.* and 1060 ⁄ 1000 of a Shilling. or *l.* 20,19 12 ⁄ 000.

261324 plain Tiles, at 16 *s.* 6 *d.*
198   12

2090592   198 *d.*
2351916
261324

Pence 51742,152
Divide *per* 12)   4

20) *s.* 431,1—10 *d.* |608

l. 215—11—10 and 608 ⁄ 1000 of a Penny.

When Things bought by the Thousand, and retailed by
the Hundred, as particularly *Dutch* and *English* Pantiles ;
then follow this Rule, *viz.*

Multiply the given Quantity by the Price, whether Shil-
lings, or Shillings and Pence. If Shillings, multiply by the
Number of Shillings, and cut off two Figures or Places to-
ward the Right-hand ; and those toward the Left are Shil-
lings ; which reduce to Pounds as usual ; and what remains,
that is, the Figures cut off, multiply by 12 ; and again, cut
off two Places more toward the Right-hand, and the Fi-
gures to the Left are Pence ; and what remains multiply by
4, &c.

Example.

1726 Pantiles, at 7 *s. per* C.

```
        7
   ⊳20|82
                  ⎫
       12         ⎬ That is, 6 l. 00 s. 9 d. ¼ and ¹³⁶⁄₁₀₀ of a Farthing.
      ─────       ⎬
      9|80        ⎭
       4
     ─────
      3|36
```

If the Price be Shillings and Pence, multiply by the Pence
contained in the Price, and proceed as before ; and then
the Figures toward the Left-hand will be Pence ; which re-
duce to Pounds according to Rule.

Example.

2964 Stock Bricks, at 2 *s.* 6 *d. per* C.
30 Pence

```
Pence  889|20  ⎫
          4    ⎬ That is, 3 l. 14 s. 1 d. and ⁸⁰⁄₁₀₀ of a
       ─────   ⎬ Farthing, or ²⁰⁄₁₀₀ of a Penny.
         80    ⎭
```

This Method is preferable to *Practice*, because of its
Exactness for the odd Number above Thousands or Hun-
dreds, which would be puzzling to be very exact as to the
odd Number ; but by this Method, the Question is solved
to the 1000 or 100 Parts of a Farthing ; as may be seen
by the foregoing Examples of the Operation.

Of

Of Bills of Exchange.

BILLS of Exchange are either Inland, or Foreign:
The Inland Bills are drawn by one Trader in one
City or Town, upon another of another City or Town in
the same Kingdom; as *London* upon *Briftol*, or *Exeter* upon
London, &c. and these chiefly concern our Shop-keepers,
and Wholesale Traders either of Town or Country; and the
Foreign more immediately concern the Merchant.

Bills of Exchange, if handsomely drawn, must be writ-
ten in a fair Hand, on a long Piece of Paper, about three
Inches broad; and writ in Form after the following Pre-
cedents.

A Bill payable at Sight.

London, 6th *October*, 1741.

AT Sight hereof, pay to Mr. *Gregory Greedy*, or his Or-
der, the Sum of fifty Pounds, for Value received of
Chriftopher Cafh; and place it to Accompt, as *per* Ad-
vice of

To Mr. Peter Punctual,   Your humble Servant,
    Grocer, in High ftreet   *Daniel Drawbill.*
in Briftol.

Note, A Bill at Sight is payable three Days after the Ac-
ceptor feeth it.

Exon, *November* 4th, 1741.

SEven Days after Sight hereof, pay to Mr. *Nathan Needy*,
or his Order, twenty-four Pounds ten Shillings, for the
Value received here of Mr. *Timothy Transfer*, and place it to
Accompt, as *per* Advice from

To Mr. Simon Certain,   Your Friend and Servant,
    Haberdafher, in Milk-   *Michael Moneyman.*
ftreet, London.

If Mr. *Needy* sends his Servant, *Andrew Benfon*, to receive
the Money; after he hath writ his Name on the Back of
the Bill, (which is his Order) the Servant must write a
Receipt to his Master's Name, thus;

REceived November 16, 1739, *the full Contents of the
within-mentioned Bill, being twenty-four Pounds, ten
Shillings.*

Witnefs,   *Nathan Needy.*
    Andrew Benfon.

A

A Foreign Bill of Exchange.

London, 6th *October*, 1739, for 460 Crowns, at
56 d. $\frac{2}{8}$ Sterling *per* Crown.

AT Ufance pay this my firft Bill by Exchange (my fecond or third not being paid) unto Mr. *Henry Vernon*, or Order, four hundred and fixty Crowns, at 56 d. $\frac{2}{8}$ *per* Crown, for the Value received of Mr. *Samuel Thompfon*, and pafs it to Accompt, as *per* Advice from, Sir,

To Mr. Will. Walker,   Your humble Servaut,
   Merchant in Paris.   *Ebenezer Reynolds.*

Another.

London, 17th *October* 1741, for 480 Dollars, at
55 d. $\frac{1}{8}$ *per* Dollar,

AT three Ufance pay this my firft *per* Exchange, unto Mr. *William Wealthy.* or Order, four hundred and eighty Dollars, at 55 d. $\frac{1}{8}$ Sterling *per* Doilar, for the Value received of himfelf, and place it to Accompt, as *per* Advice from

To Meffrs Daniel *and*   Your humble Servant,
   David Bernardifton.   *Mark Mercator.*
   Merchants in Aleppo.

Note, Ufance *in* England, *is a Calendar Month, and* Double Ufance *two Months*, &c.

Once more.

Briftol, 8 *October*, 1741, for 600 Pieces of Eight, at
53 d. $\frac{3}{8}$ *per* Piece.

AT double Ufance pay this my firft Bill of Exchange un- to Mr. *Lawrence de Luz*, or his Order, fix hundred Pieces of Eight *Mexico*, at fifty-three Pence $\frac{3}{8}$ Sterling *per* Piece of Eight, for Value received of *Gomez Henriquez*, and pafs it to Accompt, as *per* Advice from yours,

To Mr. Simon Surepay,   *William Henry Hern.*
   Merchant in Leghorn.

Notes on Bills of Exchange.

1. *THE Acceptor of any Bill is become abfolute Dr. to the Perfon to whom the Bill is payable for the Contents thereof.*

2. *The Perfon to whom the Bill is payable, muft demand the Money the very Day it becomes due, and if the Acceptor die before it becomes due, it muft be demanded of the Executor or Adminiftrator.*

I 5   3.

3. *The Drawer of any Bill, must always give his Correspondent a Letter of Advice, that he hath drawn such a Bill on him for such a Sum,* &c.

4. *None may pay a Bill without such a Letter of Advice.*

5. *A Bill is due the third Day after the Expiration of the Time mentioned in the Bill.*

Of Endorsing.

IT frequently happens, that between the Acceptance of a Bill, and the Time of Payment, the Party to whom it is first made payable, hath occasion to pay it away ; if so, he writes his Name on the back of the Bill, which is his Order, (as said before) and gives it to the Person he is indebted to, and then he is impowered to receive the Money ; and it may be, the second Person also wants to pay it away ; and then he writes his Name likewise under the other, and delivers it to a third Person to receive the Money ; and it may be, the third does the same, and delivers it to a fourth Person, *&c.* All that do so, are Endorsers ; and he that last hath the Bill, if the Acceptor will not pay it, may sue him, or the Endorsers, or Drawer, or any of them, for the Money.

An Endorsement is generally in these Words, *viz. Pay the Content of the within-mentioned Bill to* Henry Hasty.

George Greedy.

But many times the Name only is accounted sufficient.

Of Protesting.

WHEN a Bill is to be *Protested*, the Party that hath the Bill must go to a *Publick Notary*, (not a common *Scrivener)* whose Business it it ; and he goes with you to the Acceptor's House, and demands Payment, *&c.* and then he draws up a *Protest* according to Law ; which is to be returned to the Drawer within the time limitted, *&c.*

It is needless to give here the Form of a *Protest*, because no Man can do it of himself.

A Bill of Debt.

KNOW all Men by these Presents, that I Lawrence Lackcash, of Southwark, Vintner, *do owe and am indebted unto* Charles Creditman, *of the same Place,* Salter, *the Sum of one hundred and fifty Pounds, of lawful Money of* Great-Britain ; *which said Sum I promise to pay unto the said* Charles Creditman, *his Executors, Administrators, or Assigns,*

gus, on or before the 24th of December next ensuing Date ereof. Witness my Hand and Seal this 6th Day of Oct. 1741.

Sealed and delivered   Lawrence Lackcash.
in the Presence of

A Bill for Money borrowed.

REceived and borrowed of Oliver Overcash, of London, Merchant, Fifty Pounds, which I do hereby promise to pay at Demand. Witness my Hand this 6th Day of October, 1741.

Peter Penury.

——————

l. 50

The Charge of Noting and Protesting a Bill.

	s. d.			*s. d.*
Noting, { within the City	1-6	Pro- { within	3-0
{ without the City	2-6	testing, { without	5-0

The Form of a Bill of Lading.

SHipped, by the Grace of God, in good Order and well conditioned, (by *Edward Export*, of *London*, Merchant) in and upon the good Ship called (the *Bilb a Merchant* of *London*) whereof is Master under God for this present Voyage (*Martin Mizen* of *London*, Mariner) and now riding at Anchor in (the Port of *London*) and by God's Grace bound for (*Cadiz*) to say (1 Bale of T B of Bocking Baize, and 1 Trunk containing five hundred No. Pair of Silk Stockings, Contents, &c. as *per* Invoice) 1,2 being mark'd and number'd as *per* Margin, and are to be deliver'd in the like good Order at the aforesaid Port of (*Cadix*) the Danger of the Seas only excepted, unto (Mr. *Thomas Drake*, Merchant, there) or to his Assigns, he or they paying Freight for the said Goods, (three Pieces of Eight *per* C. Wt.) with Primage and Average accustomed. In witness whereof the Master or Purser of the said Ship hath affirmed to (three) Bills of Lading, all of this Tenor and Date; one of which (three) Bills being accomplished, the other (two) to stand void. And so God send the good Ship to her desired Port in Safety. *Amen.*

Dated in *London*, the 6th of *October*, 1741, Inches and Contents unknown to   *Martin Mizzen.*

Note, The several Words included in the Parenthesis, are to be put into the several vacant Places that are in a Blank Bill of Lading.

Note,

Note alſo, *Average is ſometimes the general Allowance made to the Maſter of the Ship, of* 1 d. *or* 2 d. *in every Shilling Freight Primage, a ſmall Allowance to be diſtributed among the Sailors.*

The Forms of an Invoice.

Port-Royal in *Jamaica, July* 24. *Anno* 1741.

INVOICE of five Barrels of Indico, five Hhds. of Sugar, and five Hhds. of Pymento, ſhipped on board the *George* of *London*, *George Jones* Commander, for Accompt and Riſque of Meſſrs. *John* and *Thomas Fiſher*, of *London*, Merchants, being mark'd and number'd, as *per* Margent; Conteſts, Coſts and Charges, as in the following Example, *viz.*

IF	Indico 5 Barrels			
	143 *lb.*			
	413			
Nº.	146			
125	152			
	173			
	756 *lb.* nett, at 2 *s.* 6 *d.* per *lb.*		81	18	—

Sugar 5
Hhds   Tare
C. qr. *lb*. C. qr. *lb*.   C. qr. *lb*.
11-3-27—1-2-19   Groſs 68-0-00
12-2-19—1-3-00   Tare   8 3-12
13-2-13—1-2-16   ─────────
125   14-1-15—1-3-11   Nett 59-0 16   70 19   5
15-1-10—1-3-22   at 24 *s. p. C.*
68-0-00—8 3-12

Pymento   *lb.*
5 Hhds. Tare   2026 Groſs
lb.   *lb.*   389 Tare.
432——84   ─────────
396——72   Nett 1637 at 11 *d.* ½ *p lb.*   76 14 8¼
410——81
376——70   Charges
412——82   To Coſt of 5 Barrels and
─────────   10 Hhds.   4-7-9
2026——389   To Storage————1-0-0   5   7   9

                                                                23 19 10¾
To Commiſſion at 5 *p. C.*   11 14 11¼
Errors excepted *per. A. B.*

An Account of Sales.

Port Royal, in *Jamaica, July* 24*th,* 1741.

OF 2765 Ells of brown Ozenbrigs, 1112 Yards of blue Hartford, 2 Pieces of Grey Cloth, qt. 39 Yards, 40 Pair of fine worsted Hose, and 170 Ells of Bag Holland, received from on Board the Ship *Good Success,* Capt. *Samuel Sharp,* Commander, for Account of *Laurence Lucky,* of *London,* Merchant, is Dr.

		l.	*s.*	*d.*
To Portage of ditto ——*l.* 00—17—6				
To Commission of Sales —— 12—16—3				
To Storage at 2 ½ per *C.* —— 06—08—1½				
		20	1	10½
To balance of the Nett Product carried to the Credit of your Account, bad Debts excepted————————		236	3	9½
		256	5	8

Per Contra, Cr.

	l.	*s.*	*d.*
By 2765 Brown Ozenbrigs, making 3456 Yds ¼ at 8 *d.* ½ per Yd. sold *Ambique Baker*	122	10	2
By 1112 Yds of blue Linen, sold at 7 *d.* ¾ p r Yard ———	34	3	5
By *James Smart,* for 39 Yds of Cloth, at 15 *s.* per Yard ———	29	5	0
By *Laurence Monk,* for 50 Pair of Hose, at 7 *s.* 10 *d.* per Pair ———	15	13	4
By ditto for 175 Ells of Bag Holland, at 6 *s.* 3 *d.* per Ell ———	54	13	9
	256	5	8

Errors excepted, *July* 24*th,* 1741, *per*
            Charles Careful.

Business at the Waterside, concerning Exporting and Importing of Goods, &c. *Entring them at the Custom-house,* &c.

WHEN there are Goods to Export, and ready pack'd, &c. there must first be made a Bill of Entry (as it is called) of the Contents, after this Form, *viz.*

In

In the *Loyal Merchant, William Worm,* from *Barbadoes.*
<div align="right">*Edwin Export.*</div>

Three Cafes of Haberdafhery.
Five Tuns of Beer, &c.

Of thefe Bills there muft be feven, one of which muft be in Words at length, and the other may be expreffed in Figures: Thefe are by the Clerks of the Cuftom-houfe entered into feveral Books for that Purpofe.——If fome Goods pay Cuftom, and others not, then there muft be made two Entries; one for thofe that pay Cuftom, and another for thofe that pay not; and likewife you muft have two Cockets.

A *Cocket* teftifies the Payment of all Duties; and is writ on a fmall Piece of Parchment, in the following Words:

Know ye, That Edwin Export, *Merchant, for Three Cafes of Haberdafhery, and five Tuns of Beer, in the* Loyal Merchant, Wiliam Worm, *for* Barbadoes, *hath paid all Duties. Dated 9th* November, 1741.

On the Backfide of the *Cocket* you muft fet down the Marks, Numbers, and Quantity of the Goods expreffed in the Infide——When on clean Paper tranfcribe your Bill of Entry; upon which a Shipping Bill will be made out; on the Back of which, fignify the Marks, Numbers and Contents, as before on the *Cocket*; both which being thus Endorfed, you are to deliver them to the Searcher at the Water-fide, who depofits them in the Office 'till the going away of the Ship, and then they are delivered to the Captain or Mafter of the Ship.

If you have not Judgment or Experience enough to enter your Goods yourfelf, 'tis but applying yourfelf to any one of the Clerks in the Long-Room, who make it their Bufinefs (and good Bufinefs too) to enter People's Goods; and for a Shilling (you giving them the Contents) they will write your Bills, and pafs your Entries, without giving you any further Trouble, or your running any Rifque of making any falfe Entries, &c.

Entry Inwards.

THE Ship being arrived, fearch the Entry-Book in the Long-Room, and you will find the Name of the Ship and Captain, as alfo the Waiters that are to attend the Delivery of the Ship, and at what Key the Goods will be landed. The Entry Inward runs thus:

In the Mercury, John Keenhaul, *from* Antegoa.
25 Hhds of Sugar, &c.
56 Bags of Cotton, &c.

There muſt be eight of theſe Bills, (though but ſeven Outwards) and one of theſe muſt be in Words at length, (as well as one of the ſeven Bills Outwards) which is for the Warrant of Delivery ; and muſt be ſigned by the Perſon in whoſe Name the Goods are entered ; and the Mark alſo in the Margin ; which being done, and the Fee for Entry, and Cuſtom paid, you will then have from the Land-Waiters a Warrant for the Landing and Receiving your Goods.

When Goods are to be exported by Certificate, *viz.* Foreign Goods formerly imported ; theſe Goods being to be ſent Abroad, or exported to another Place or Country by a Native of *England* within Twelve, or a Stranger within Nine Months after Importation, entitles the Exporter to a Drawback of Part of the Cuſtom paid at the Importation of the ſaid Goods, (producing a Certificate from the Comptroller, that they have paid the Duties Inwards.) And the Debenture of Cuſtom Drawback runs thus :

Debenture.

CHriſtopher Commerce, *Natural born, did on,* &c. *make an Entry with us of Two thouſand Ells of broad* German *Linen, in the* Amazon, *Capt.* Steven Stout, *for* Jamaica, *the Subſidy,* &c. *was paid Inwards by,* &c. *as appears per Certificate of the Collector Inwards : And for farther Manifeſtation of his juſt Dealing therein, he hath alſo taken Oath before us of the ſame.*

Cuſtom-houſe, London, 9*th* November, 1741.

The Oath.

Jurat C. C. *That Two thouſand Ells of broad* Germany *Linen, above-mentioned, was really Shipped out, and hath n t been relanded in any Port or Creek in* England *or* Wales, *ſince laſt Shipped,* Nov. 9, 1741.

The Certificate Cocket.

London ; *Know ſe, that* C. C. *for Two thouſand Ells of broad* Germany *Linen, paid per,* &c. *the Day,* &c. *laſt, late unladen, and now in the* Amazon, Stephen Stout, *for* Jamaica. *Dated the* 9*th of* November, 1741.

This *Certificate Cocket* is gained by applying to the Books of the Importer, to know the Day, &c. when the Cuſtom Inward was paid, and by whom ; which carry to the Long-Room in the *Cuſtom-houſe,* and deliver it to the Comptroller's
Clerk

Clerk of the Subfidy Inward and Outward, with an Account of what you would Export, &c.

A little before was mentioned at what Key the Goods fhould be landed, and therefore here it is proper to name the Keys (or rather Quays) and Wharfs that Goods are ufually landed at; which are thefe, *viz*.

Somer's Key, Smart's Key, Wiggen's Key, Bear Key, Dice Key, Cuftom-houfe Key, Potter's Key, Wool Key, Gally Key, Brewer's Key, Ralph's Key, Chefter's Key, Lyon's Key, Cox's Key; Hammond's, Young's and Gaunt's Keys. And the Wharfs are, *Frefh Wharf* and *Botolph Wharf*.

Befides thefe, there are certain Places called *Docks*, which are Harbours cut into the Land, where there is no Current, but only a Flow, and an Ebb, occafioned by the Rife and Fall of the Tide in the River of *Thames*; and thefe are convenient for the Lying of Veffels, Hoys, Lighters, Barges, and Boats; and are thefe, *viz*.

Billinfgate Dock, Sabb's Dock, Tower Dock, St. Katherine's Dock, Wapping Dock, Hermitage Dock, Execution Dock, and *Limehoufe Dock.* And above Bridge, *Queenhithe Dock, Puddle Dock, White Friar's Dock,* and *Scotland-yard Dock.* And on *Southwark* or *Surrey* fide, are *Saviour's Dock, Clink Dock, Savery's Dock* below the Bridge-yard, and *Shadwell Dock*; and feveral others for private Ufes——But more particulaily eminent on that Side the Water, is the *Bridge-yard* for Landing fundry forts of Merchandizes, but chiefly from the Ports of *England*.

Of Wharfage and Lighterage.

WHarfingers have feveral Managers over them, and alfo a Committee to redrefs Grievances, &c. and Clerks of the Stations, with Lighter Managers, and have the Letting of many Warehoufes, (which now are very fine and commodious, being rebuilt fince the fad Fire in *Thames-ftreet*) Cellars, &c. and have the Privilege of keeping Lighters for the Crrriage of Goods to and from Ships.

The Rates of Wharfage,

Are generally computed at 12 *d. per* Tun, whether Outward or Inwards: excepting Sugars from the *Weft-Indies*, which pay 2 *s. per* Tun, 4 Hogfheads being accounted a Tun (though they weigh more;) Crainage is included in the 12 *d. per* Tun Wharfage; and for Lighterage, the Wharfingers have 12 *d. per* Tun for 4 Hogfheads of Sugar that come from

the

the *West-Indies*; and for Wine and other Goods, the Lighterage is half as much as the Wharfage.

Husbands of Ships.

WHERE several Persons are concerned in a Ship, there is usually a Husband chosen by them to take an Account of every Merchant's Goods, &c. and pay the Wharfage, Lighterage, Porterage, &c. and these Husbands are to collect every Merchant's Proportion, when they do the Owner's Freight.

An Account of the several Counties of *England* and *Wales*, with their produce, Market Towns, and Market-Days, &c.

Note, *m* stands for Monday, *tu* for Tuesday, *w* for Wednesday, *th* for Thursday, *f* for Friday, and *f* for Saturday.

Berkshire,

IS supposed to contain about 527000 Acres, is 120 Miles in Circumference, hath Plenty of Corn, Cattle, Wool, and Wood, (especially Oak) and is accommodated with Water Carriage, by the very fine Rivers of *Thames* and *Kennet*;

And hath these Market-Towns, viz.

Reading, the Shire-Town, Market-Day on Saturday.

Abbington, *m* and *f*	Newberry, *th*
Windsor, *f*	Farringdon, *tu*
Wallingford, *tu* and *f*	Wantage, *f*
Maidenhead, *w*	East-Isley, *w*
Hungerford, *w*	Oakingham, *th*.
	& One more.

Buckinghamshire,

Is an Inland County as well as *Berkshire*; it contains about 441000 Acres, is 138 Miles in Circumference, abounds in Corn and Cattle, and is very considerable for Wool. The principal Rivers in this Shire are *Tame*, *Ouze*, and *Coln*.

Market-Towns.

Buckingham, *f*	Wendover, *th*
Aylesbury, *f*	Amersham, *tu*
High Wickham, *f*	Newport-pagnel, *f*
Marlow, *f*	Colebrook, *w*

Stony-

Stony Stratford *f*	Risborough, *f*
Oundle *m* *is in Northampton-*	Invingho, *f* *Ivinghoe,*
Beconsfields, *th* *shire.*	Winslow, *th.*
Chesham, *w*	

Bedfordshire.

Contains about 260000 Acres, is 73 Miles in Circumference, well stored with Corn and Cattle, and famous for Fuller's Earth, &c.

Market-Towns.

Bedford, *th* and *f*	Luton, *m*
Dunstable, *w*	Shefford, *f*
Wooburn, *f*	Bigglefwade, *th*
Ampton-Hill, *th*	Potton, *f*
Leighton, *m*	Tuddington, *f.*

Cambridgeshire.

Is an Inland County, contains about 570000 Acres, is 130 Miles in Circumference, and affords Plenty of Corn, Cattle, and Wild Fowl. *Cambridge* is the Shire Town, and remarkable for a famous University, containing 12 Colleges, and 4 Halls, all well endowed, and are as followeth, *viz.*

When Founded.	COLLEGES	By whom founded.
1284	*Peter-House* ——	by Hugh de Batham, *Balsham,* Bishop of Ely.
1346	*Corpus Christi* or *Bennet,* }	by Henry of Monmouth, Duke of Lancaster.
1557 1348	*Gonvil* and *Caius,*	so call'd from its several Founders.
1441	*King's,* ——	by King Henry the 6th.
1448	*Queen's,* ——	by Margaret his Queen.
1497	*Jesus,* ——	by L. L. D. Bishop of Ely. *John Alcock*
1506	*Christ's* ——	by Margaret, Countess of Richmond.
1506	*St. John's,* ——	by ditto.
1542	*Magdalen,* ——	by Edw. Strafford, D. of Buckingham.
1546	*Trinity,* ——	by King Henry the 8th.
1584	*Emanuel,* ——	by Sir Walter Mildmay.
1598	*Sidney Suffex,* —	by Frances Sidney, Countess of Suffex.
	HALLS.	
1343	*Clare,* ——	by Richard Badew.
1347	*Pembrook,* ——	by Mary, Countess of Pembrook.
1353	*Trinity,* ——	by W. Bateman, Bishop of Norwich.
1549	*Catherine,* ——	by Robert Wood, the Chancellor.

Market

Market-Towns.

Cambridge, *f*	Merche, *f*
Ely, *tu*	Wisbich, *f*
Caxton, *tu*	Royston, *w*
Linton, *th*	Soham, *f.*
New-Market, *tu*	

Cheshire

Is a Maritime or Sea-County, containing 720000 Acres, and is in Circumference about 118 Miles. Cheese and Salt are the principal Commodities : For the first, no Place in the World equals it ; and for the latter, if there was but a sufficient Quantity, there would be no Occasion for Voyages to the Isle of *May.*

Market-Towns,

Chester, *w* and *f*	Frodsham, *w*
Congleton, *f*	Stockport, *f*
Namptwich, *f*	Sandwich, *th*
Middlewich, *f*	Alstringham, *tu*
Norwich, *f* *Northwich,*	Malpas, *m*
Macclesfield, *m*	Knotsford, *f.*
	and *Two more.*

Cornwall

Is a Maritime County in the most Western Part of the Kingdom, containing about 960000 Acres, and is 150 Miles in Circumference. The chiefest Commodities are Tin and Copper, particularly the former ; it also affords great Plenty of Wild Fowl, especially Woodcocks in the Season : It likewise yields great Quantities of Samphire, Eringo, fine Slate, and Marble ; above all the rest, vast Quantities of Tin, which are yearly exported to *France, Spain,* and other Foreign Countries.

Market-Towns.

Lancaster is the chief Town, *f*	Penrin, *w, f* and *f* *Lanceston,*
Lestard, *f*	Tregony, *f*
Liftwithel, *f*	St. Ives, *w* and *f*
Truro, *w* and *f*	Penfance, *th*
Bodmin, *f*	Foway, *f*
Helston, *f*	St. German, *f*
Padstow, *f*	St. Columbe, *th*
Lachelford, *f*	Falmouth, *th*
Grampound, *f*	Market-jew, *th*
	and *Four more.*

Cum-

Cumberland,

Is also a Maritime County, bounded Northward with Scotland, and Westward with the *Irish* Sea; it contains about 1040000 Acres, and is in Circumference 168 Miles; it is a fruitful Country, affording good Pasture on the Hills, and good Corn in Plenty in the Vallies: Fish and Wild Fowl are very plentiful, and Coals in Abundance; likewise large Mines of Lead and Copper, which are both very good in their Kind.

Market-Towns.

Carlisle is the chief, *s*	Holm, *s*
Cockermouth,	Egermont, *s*
Whitehaven, *th*	Kirke Oswald, *th*
Penrith, *tu*	Longtown, *th*
Keswick, *s*	Ravenglass, *s*
Brampton, *tu*	Wigtown, *tu*

Derbyshire,

Is an Inland County, 130 Miles in Circumference, and contains about 680000 Acres, affords good Store of Corn and Wood, likewise considerable Quantities of Free-stone and Marble, Coal and Lead Mines in Abundance; also it yields Crystal and Alablaster.

Market-Towns.

The County Town is Derby, *s*	Ashburn. *s*
	Alfreton, *m*
Chesterfield, *s*	Bakewell, *m*
Worksworth, *tu*	Dronsfield, *th*
Bolsover, *s*	Fiddlewall, *w*

Devonshire,

Is a Maritime County, about 200 Miles in Circumference, and contains near 1920000 Acres; it lies on the West of *England*, and joins to *Cornwall*, having the Sea on the North and South; it affords great Plenty of Corn, Wool, Fowl and Fish, as also Lead and Tin Mines; but the principal Manufactures are Kersies, Serges, and Lace.

Market-Towns.

Exon is the Capital, *w* and *s*	Tiverton, *tu*
Barnstaple, *s*	Plymouth, *m* and *tu*
Honiton, *s*	Totness, *s*
Oakhampton, *s*	Ashburton, *s*
Plimpton, *s*	Biddiford, *tu*
Tavistock, *s*	Torrington, *s*

Axminster, *s*

Culliton, *th*

Dodbrook, *w*

Autrey, *tu*

Cudee, *s*

Hatherleo, *tu*

Moreton, *s*

Kingsbridge, *s*

and Seventeen more,

Dorsetshire,

Is a County exceeding pleasant and fruitful, and lies upon the Channel, being 150 Miles in Circumference, and contains about 772000 Acres, yielding great Plenty of Corn, Cattle, Wool, Fish and Wild Fowl ; and it also affords Abundance of Hemp, Free-stone and Marble.

Market-Towns.

Dorchester is the County Town, *s*

Weymouth, *tu* and *s*

Melcomb-Regis, *tu* and *s*

Shaftsbury, *s*

Pool, *m* and *tu*

Wareham, *s*

Gorse-castle, *tu*

Cranborn, *w*

Blandford, *s*

Abbotsbury, *th*

Cerne, *w*

Frampton, *th*

Sherbourn, *tu* and *s*

Wimbourn, *s*

Sturminster, *th*

and Four more.

Durham,

Is a County Palatine, and lies very far in the North of the Kingdom, the Air very cold, and the Ground not so fruitful as the Southern Parts : 'Tis 107 Miles in Circumference, and contains about 610000 Acres ; its chief Commodities are Coal, Iron and Lead.

Market-Towns.

Durham is the principal, *s*

Aukland, *th*

Darlington, *m*

Sunderland, *s*

Bernard's Castle, *w*

and Two more.

Essex.

Is a County bounded by the Sea, and lies in the Eastern Part of *England* ; is 146 Miles in Circumference, and contains 1240000 Acres ; the Soil yields Plenty of Corn, Cattle and Wood : At *Wallden* it affords great Store of Saffron ; and the best in the whole World, the *Spanish* being nothing in comparison to it.

Market-Towns.

Colchester is the County Town, *s*

Harwich, *tu*

Malden, *s*

Chelmsford, *s*

Barking, *s*

Hatfield, *s*

Rumford, *w*

Wall-

Wallden, *f* | Halstead, *f*
Epping, *th* and *f* | Hornden, *f*
Braintree, *w* | Raleigh, *f*
Billercay, *tu* | Maintree, *tu*
Brentwood, *th* | Waltham Abbey, *tu*
Dumore, *f* | Troxtead, *f*
Coggeshall, *f* | Sudbury, *f*
Grayes, *th* |

Glocestershire.

Is a County exceeding fruitful and delightful; and take it all together, one of the pleasantest Parts of the Kingdom. It contains about 800000 Acres, affords some of the best Cheese in the Nation, and Wool hardly inferior to *Spanish.* It also abounds in Wood, Iron, Steel, and Salmon; but its chiefest Manufacture is the Woollen, which is very extraordinary.

Market-Towns.

Glocester, the County Town, *w* and *f* | Lechlade, *tu*
 | Newent, *f*
Cirencester, *m* and *f* | Sudbury, *th*
Tewksbury, *f* | Paufwick, *tu*
Blackley, *w* | Stow, *th*
Dursley, *th* | Tedbury, *w*
Camden, *w* | Wickmore, *m*
Newham, *f* | Thornbury, *f*
Stroud, *f* | Winchcomb, *f*
Cheltenham, *th* | Wotton, *f*

and Eight more.

Hampshire.

Or the County of *Southampton*, borders upon the Channel, being a pleasant, healthful, and fruitful Country, about 100 Miles in Circumference, and contains about 1312500 Acres. It affords vast Plenty of Corn, Grass, Sheep, and Wood, and particularly famous for Hogs and Honey, both of which are most excellent in their kind.

Market-Towns.

Southampton the County Town, *tu* and *f* | Basingstoke, *w*
 | Kinsclear, *tu*
Winchester, *w* and *f* | Ringwood, *w*
Portsmouth, *th* and *f* | Odiam, *f*
Andover, *f* | Rumsey, *f*
Limington, *f* | Alceston, *th*
Alton, *f* | *and Eleven more.*

Hert

Hertfordshire,

Is a very fine inclos'd County, the Land somewhat stony, but yet very fruitful, affording great Plenty of Corn, and is very remarkable for good Malt; it is 130 Miles in Circuit, contains about 451023 Acres, and hath an excellent Air, &c.

Market-Towns.

Hertford is the County Town, *f*	Buntingford, *m*
St. Albans, *f*	Baldock, *th*
Barnet, *m*	Hitchin, *th*
Ware, *tu*	Hodsdon, *th*
Barkhamstead, *m*	Stevenage, *f*
Rickmansworth, *f*	Tring, *f*
Hatfield, *th*.	Watford, *tu*
	Hempsted, *th*
	and Two more.

Herefordshire,

Is an Inland County of a good Soil, and healthful Air, 100 Miles in Circuit, and contains about 660000 Acres: It affords Plenty of Wool, Wheat, Salmon, and Cyder, which are generally esteemed the best in the Kingdom.

Market-Towns.

Hereford is the Capital, *w, f, f*	Weobly, *th*	Pemb, *tu*
Lempster, *f*	Kyniton, *w*	Ledbury, *tu*
	Ross, *th*	Bromyard, *m*

Huntingtonshire,

Is a small Inland County, of about 67 Miles in Circuit, and contains about 240000 Acres: It is an open Country, but generally very fertile and delightful, abounding in Corn and Cattle, which are its chiefest Commodities.

Market-Towns.

Huntington the chief, *f*	St. Neots, *th*
St. Ives, *m*	Ramsey, *w*
Kimbolton, *f*	Yaxley, *tu*

Kent,

Is a Sea-County on the East part of the Channel; it is 160 Miles in Circumference, and contains about 1248000 Acres, being distinguish'd into three Parts, *viz.* the Marshy, as Rommy Marsh, &c. the Downs, the Middle or Woody Part. It affords plenty of Corn, good Pasture, and the best Cherries and Pippins in the Kingdom.

Mar-

Market-Towns.

Canterbury (famous for its Cathedral) is the Capital, *w* and *ſ*	Smarden, *ſ*	Lenham, *tu*
	Hithe, *ſ*	Lidd, *th*
	Bromley, *th*	Sevenoak, *ſ*
	Cranebrook, *ſ*	Tenterden, *ſ*
	Cray, *w*	Malling, *ſ*
Rochefter, *ſ*	Dartford, *ſ*	Milton, *ſ*
Maidſton, *th*	Eltham, *m*	Tunbridge, *ſ*
Dover, *w* and *ſ*	Feverſham, *w* and *ſ*	Weſtram, *w*
Sandwich, *w* and *ſ*	Folkſton, *th*	Voolwich, *ſ*
		Wrotham, *tu*
Romney, *th*	Gravefend, *w* and *ſ*	Wye, *th*

and Four more.

Suſſex,

Is a Maritime County, lying upon the Channel between *Kent* and *Hampſhire*, containing 1140000 Acres, and is 158 Miles in Circumference. The County is both fertile and healthful, and is moſt exceeding pleaſant; the South Downs being the moſt delectable or delightful Part of the whole Kingdom; and as I know them, I alledge them to have the moſt beautiful Variety, and the pleaſanteſt Proſpect that can be in the whole Culture of Nature; the Soil being exceeding rich, occaſioned by the numerous Flock of Sheep there kept; and therefore produce wonderful Crops of Corn of all Sorts : It alſo hath the fineſt Woods and Rivers, and affords the beſt of Game, of Hunting, Fiſhing, and Fowling.

Market-Towns.

Chicheſter is the chief, *w* and *ſ*	Midhurſt, *th*
	Steyning, *w*
Eaſt-Grinſtead, *th*	Petworth, *w*
Haſtings, *w* and *ſ*	Battle, *th*
Rye, *w* and *ſ*	Hailſham, *ſ*
Arundel, *w* and *ſ*	Bright-Helmſton, *th*
Horſham, *ſ*	Cuckfield, *ſ*

and Six more.

Lancaſhire,

Is a Sea-Coaſt County, bounded on the Weſt by the *Iriſh* Sea; 'tis 170 Miles in Circuit, and contains 1150000 Acres: the Air is very wholeſome, and the People generally live to an advanced Age : The Soil is very good, and yields Corn of all Sorts, particularly Oats, which are looked upon as the beſt in the Kingdom : It affords alſo Plenty of Pit-Coal, and great Quantities of excellent Fiſh of all Sorts.

Mar-

Market-Towns.

Lancaster is the County Town *ſ*	Ulverſton, *th*	Roachdale, *tu*
	Bolton, *m*	Howſtead, *m*
Clithero, *ſ*	Blackbourn, *m*	Hoſlingdon, *w*
Liverpool, *ſ*	Cartmel, *m*	Gariſtrong, *th*
Preſton, *w.ſ,* and *ſ*	Coln, *w*	Kirkham, *tu*
Wigan, *m,* and *ſ*	Bury, *th*	Hornby, *m*
Manchefter, *ſ*	Charnley, *tu*	Ornſkirk, *tu*
Warrington, *w*	Dalton, *ſ*	Poulton, *m*
		and Four more.

Leiceſterſhire,

Is a fine pleaſant Inland County, 96 Miles in Circuit, contains about 560000 Acres, abounds in Corn and good Paſture, and is very remarkable for Beans and Peas for Horſes, which thrive there the beſt of any County in *England*; it is alſo eminent for large Sheep, which produce Abundance of Wool, and the longeſt in the Kingdom.

Market-Towns.

Leiceſter is the County Town, *m* and *ſ*	Hinkley, *m*
	Lutterworth, *th*
Aſhby de la Zouch, *ſ*	Loughburrough, *th*
Boſworth, *w*	Milton, *tu*
Harborough, *tu*	Mountſorrel, *m*
Hallaton, *th*	Waltham, *w* and *th*

Lincolnſhire,

Is a Maritime County, part bordering on the *German* Sea, and contains about 1740000 Acres, being 130 Miles in Circuit: The Weſtern Parts are good and fruitful, having Plenty of Graſs, and breed the largeſt Oxen in the Kingdom, but the Eaſtern Parts are marſhy, though well ſtored with Wild Fowl.

Market-Towns.

Lincoln is the Capital, *ſ*	Stanton, *m*	Womsfleet, *ſ Wainfleet,*
	Binbrook, *w*	Dunnington, *ſ*
Boſton, *w* and *ſ*	Alford, *tu*	Falkingham, *th*
Grantham, *ſ*	Burton, *m*	Holbeck, *th Holbeech,*
Stamford, *m* and *ſ*	Barton, *m*	Horncaſtle, *ſ*
Grinſby, *w*	Kirton, *th*	Louthe, *w* and *ſ*
Gainſborough, *tu*	Bourn, *ſ*	Sleeford, *m*
Bullingbrook, *tu*	Tatterſhall, *ſ*	Spilſby, *m.*
Spalding, *tu*		*and Ten more.*

Middleſex,

Is the Metropolis of the Kingdom, an Inland County, having the Soil fertile by Improvement, and the Air ſweet and

K

and wholefome as any in the Kingdom ; the *Thames* that
runs through it, parts it from the County of *Surrey,* and is
on all Accounts the fineſt River in the World.

Market-Towns.

London the Metropolis, hath Markets for every Day in the Week.	Stains, *f*
	Uxbridge, *th*
	Enfield, *f*
Weſtminſter *m, w,* and *f*	Edgworth, *th*
Brentford, *th*	

Monmouthſhire,

Lies upon the Borders of *Wales,* and formerly reckoned
a Part of it, but now numbered among the *Engliſh* Coun-
ties : It is accommodated by the famous River *Severn,* the
ſecond in the Kingdom ; and contains 34000 Acres, being
80 Miles in Circuit. This County is healthful, abounding
with Corn, Cattle, Salmon, and Trout.

Market-Towns.

Monmouth, the principal, *f*	Caerleon,	Pontpool, *f*
	Chepſtow, *f*	Uſke, *m* and *f*
Abergavenny, *tu*	Newport, *f*	

Norfolk,

Is a large County, bordering on the Northern Coaſt, up-
on the *German Sea :* 'tis 180 Miles in Circuit, and con-
tains 1148000 Acres.   The Soil is different, in ſome Places
fertile, in others ſandy, and in ſome deep and heavy. Its
principal Commodities are Corn, Wool, Honey, and ſome
Saffron ; but the chief of it are Stuffs and Herrings, the
firſt from *Norwich,* and the latter from *Yarmouth.* Some-
times Jet and Amber are found on the Sea Coaſt.

Market-Towns.

Norwich is the Capital, *w, f,* and *f*	Dearham, *f*	Caſton, *tu*
	Walſingham, *f*	Comer, *f*
	Downham, *f*	Diſs, *f*
Lynn, *tu* and *f*	Walſham, *w*	Harleſton, *w*
Yarmouth, *f*	Windham. *f*	Herling, *tu*
Thetford, *f*	Ropeham, *f*	Holt, *f*
Attleborough, *th*	Snaſham, *f*	Wotton, *w*
Aleſham, *f*	Falkenham, *th*	Worſted, *f*
Buckingham, *f*	Foulſham, *th*	Seby, *every ſe-*
Burnham, *f*	Hingham, *f*	*cond* Monday

and Six more.

Northamptonshire,

Is accounted one of the finest Inland Counties in the Kingdom ; is 120 Miles in Circuit, and contains about 550000 Acres. The Air good, and the Soil rich ; hath several fine Rivers, and abounds in Corn, Wood and Cattle.

Market-Towns.

Northampton, the County-Town, *f*	Daventry, *w*	Kettering, *f*
	Oundle, *f*	Wellinborough, *w*
Peterborough, *f*	Towcester, *f*	Trapstone, *iu*
Brackley, *w*	Rothwell, *m*	Clift, *tu*

and Two more.

Northumberland,

Is a Sea-County, bordering upon *Scotland* ; in some Part the Air is sharp, the Soil thin and barren ; but towards the Sea it is tolerably fruitful. In this County are abundance of Lead and Coal Mines, from whence comes the Coals called Sea-Coals. Here are good Store of Wild Fowl and Fish, particularly Salmon.

Market-Towns.

Newcastle is the chief Town, *f*	Morpeth, *w*
	Saxham, *tu*
Berwick, *f*	Weller, *tu*

and One more

Nottinghamshire,

Is an Inland County, in Circuit 110 Miles, and contains 560000 Acres : The Air is good and healthful, the Soil but indifferent (a great Part being Forest Ground) the South Part pretty fruitful, the West woody, and yields Plenty of Pit-Coal. The River *Trent* divides it from *Lincolnshire.*

Market-Towns.

Nottingham is the County Town, *w*, *f*, and *f*	Southwell, *f*
Newark, *w*	Bingham, *th*
Retford, *f*	Worsop, *w*
Mansfield, *th*	Tuxford in the Clay, *m*.

Oxfordshire,

Is one of the most pleasant, healthful, and fertile Counties in the Kingdom ; 'tis watered with delightful Rivers, as the *Thames*, the beautiful *Charrald*, &c. but above all, it is famous for having the finest University in the World, which consists of 18 Colleges endowed, and 7 Halls not endowed, *viz.*

K 2 Founded,

* Cherwell,

Founded, Anno,	COLLEGES.	By whom founded.
872	University,	by the Saxon King Alfred.
1262	Baliol,	* by John Baliol, King of Scotland.
1274	Merton,	by Walter de Merton, Bishop of Rochester.
1316	Exeter,	by Walter Stapleton, Bp. of Exeter.
1337	Oriel,	by King Edward II. *1317.*
1340	Queen's,	by Robert Eglesford, B. D.
1375	New,	by William of Wickham, Bishop of Winchester.
1420	Lincoln,	by Richard Flemming, Bishop of Lincoln.
1437	All-Souls,	by Henry Chicheley, A. Bp. of Cant.
1452	Magdalen,	by William of Womfleet Bp. of Winchester. *Wainfleet,*
1515	Brazen-Nose,	by William Smith, Bp. of Lincoln, and Richard Sutton.
1516	Corpus Christi,	by Richard Fox, Bp. of Winchester.
1542	Christ's Church,	by King Henry VIII. *First by Cord. Wo*
1555	Trinity,	by Sir Thomas Pope.
1557	St. John's,	by Sir Tho. White, Merchant of London.
1572	Jesus,	by Queen Elizabeth. *First by Hugh*
1613	Wadham,	by Nicholas Wadham, Esq;
1620	Pembroke,	by Thomas Tesdale, Esq; and Richard Whitwick, B. D.

(left margin note:) * Baliol College was founded by John Baliol, of Bernard Castle in Yorkshire, & his Wife Devorgilla Daughter of Alexr. III. K. of Scots, & Mother to this Baliol K. of Scotland.

HALLS.

St. Edmonds, St. Albans, Hart, St. Mary's, New Inn, Magdalen, Gloucester — belonging to — Queen's, Merton, Exeter, Oriel, New, Magdalen — College.

Market-Towns in Oxfordshire.

Oxford, the Capital, *w* and *f*. Woodstock, *tw* Banbury, *th* Burford, *f* | Henley, *th* Watlington, *f* Witney, *th* Chipping Norton, *f* | Deddington, *f* Bicester, *f* Bampton, *w* Tame, *tu* Charlbury, *f* Rutla...

and Two more.

Rutland,

Is a small Inland County, 40 Miles in Circumference containing about 110000 Ares; affords Plenty of Corn and Cattle, and is remarkable for the Redness of the Wooll which the Sheep of that County produce, occasioned by the Colour of the Soil.

Market-Towns.

Oakhampton, *f*	Uppingham, *w*

Shropshire,

Is a plentiful Inland County, the Air good, and so is the Soil; it is in Circuit 134 Miles, containing about 890000 Acres, and affords Plenty of Corn, Wood and Pit-coal, being accommodated by the River *Severn*.

Market-Towns.

Shrewsbury, the County Town, *w*, *th*, and *f*	Ludlow, *m*	Drayton, *w*
	Wenlock, *m*	Wem, *th*
	Elismere, *tu*	Church-stretton, *tu*
Bishopscastle, *f*	Whitchurch, *f*	Ofwestry, *m*
Bridgenorth, *f*	Newport, *f*	Shipton, *tu*
		and One more.

Somersetshire,

Is a large plentiful Sea-County in the West of *England*, in Circumference 204 Miles, containing about 907500 Acres; it affords great Plenty of excellent Corn, and good Pasture, which feeds abundance of fine Cattle; and also yields Plenty of Lead, Copper, Chrystal Stones, and Wood for Dyers: Its chief Manufactures are Cloth and Serges.

Market-Towns.

Bristol is the Capital, *w* and *f*	Southpetherton, *th*	Canefham, *th*
Bath, *w* and *f*	Axbridge, *th*	Crookhorn, *f*
Wells, *w* and *f*	Sheptonmallet, *f*	Dulverton, *f*
Bridgewater, *th*	Somerton, *m*	Glastenbury, *tu*
Ilchester, *w*	Wellington, *tu*	Chard, *m*
Taunton, *w* and *f*	Bruton, *f*	Longport, *f*
Wincanton, *w*	Ilminster, *f*	Poutford, *tu*
Watchet, *f*	Dunstar, *f*	Writton, *tu*
	Wivelscomb, *tu*	*and Five more.*

Staffordshire,

Is an Inland County, containing about 810000 Acres, and is 141 Miles in Circuit; the Air is sharp, but very health-

K 3

healthful ; the Soil different : Northward 'tis hilly and bar-
ren ; but Southward it is fruitful and pleafant, and affords
Plenty of Corn, Grafs, Iron, and Pit-Coal ; the middle Part
is level, but fomething woody : This County alfo affords
good Stone, Marble, Alabafter, and Lime-ftone.

Market-Towns.

Stafford is the County-Town, *f*	Utuxetar, *w*	Betley, *ta*
	Eccleshall, *f*	Locke, *w*
Litchfield, *tu* and *f*	Ridgley, *tu*	Tudbury, *tu*
Newcaftle, *m*	Browley, *tu*	Stow, *cu*
Burton, *th*	Breewood, *tu*	Wolverhampton,
Penbridge, *tu*	Walfhall, *tu*	*w.*

Suffolk,

'Is a Sea County, 140 Miles in Compafs, and contains
995000 Acres ; the Soil different, the beft Part about *St. Ed-
monsbury* ; it affords abundance of Cattle, and Butter of the
beft, but Cheefe the worft in *England.*

Market-Towns.

Ipfwich is the Prin-cipal, *w, f,* and *f*	Ixworth, *f*	Neyland, *f*
	Needham, *w*	Lavenham, *tu*
	Stowmarket, *th*	Mildenhall, *f*
Dunwich, *f*	Newmarket, *th*	Bildefton, *w*
Orford, *m*	Beccles, *f*	Clare, *f*
Alborough, *f*	Bury, *w*	Bungay, *th*
Sudbury, *f*	Hadley, *m*	Holfworth, *tu*
Eye, *f*	Framlington, *f*	Mendlefham, *tu*
Dedingham, *f*	Leftoff, *w*	Woodbridge, *w*
		and Three more.

Surry,

Is an Inland County, parted by the River of *Thames* from
Middlefex : It contains about 592000 Acres, and is in Com-
pafs 112 Miles ; the Country is plentiful, and the Air
healthful ; it is famous for Hunting and Horfe-racing : The
principal Goods are Hats made in *Southwark* for Exportation.

Market-Towns.

Guilford is the County-Town, *f*	Southwark, *w* and *f*	Kingfton, *f*
		Croydon, *f*
Rigate, *tu*	Darking, *th*	Farnham, *th*
		and Two more.

Warwickfhire,

Is a pleafant, healthful, and plentiful County, 155 Miles
in Compafs, and contains about 670000 Acres ; the Soil,
for

for the most part, is good and fertile ; on the North a little woody : This County is remarkable for excellent Cheese, going by its Name.

Market-Towns.

Warwick is the County-town, *∫*	Aalcester, *tu*	Nuneaton, *∫*
Coventry, *∫*	Birmingham, *th*	Rugley, *∫*
Stratford, *th*	Coleshill, *w*	Southam, *m*
Atherstone, *tu*	Henley, *m*	Suttonbolefield, *m*
	Kyneton, *tu*	and *Five more*.

Westmoreland,

Is a County in the Northwest of *England*, is 120 Miles in Circuit, containing about 510000 Acres : This County abounds in Hills and Marshes ; and is not very plentiful but in some of the Vallies and Intervals, and towards the South.

Market-Towns.

Appleby is the County-town, *∫*	Longsdale, *th*	Kirbysteven, *∫*
Kendal, *∫*	Burton, *tu*	Orton, *w*
	Ambleside, *w*	Brough, *w*

Wiltshire,

Is a fine Inland County, 140 Miles in Compass, and contains about 876000 Acres: In the Middle lies *Salisbury-Plain*, very remarkable for its large Extent, and for feeding large Numbers of Sheep ; and therefore Wool is the principal Commodity.

Market-Towns.

Salisbury is the Capital, *w* and *∫*	Lavington, *w*	Colne, *tu*
Hindon, *th*	Wotton-basset, *th*	Warminster, *∫*
Chippingham, *∫*	Cricklade, *∫*	Bradford, *m*
Wilton, *w*	Devizes, *th*	Amsbury, *∫*
Marlborough, *∫*	Dounton, *∫*	Auburn, *tu*
Malmsbury, *∫*	Wesbury, *∫*	Swindon, *m*
	Highworth, *w*	Troubridge, *∫*
		and *Two more*.

Worcestershire,

Is a plentiful Inland County, 130 Miles in Circuit, and contains 540000 Acres ; the Soil is, for the most part, good and fertile, affords Corn in great Plenty, and is very numerous in Cattle ; it yields Plenty of Fish and Fruit. The Vale of *Evesham* is justly esteemed one of the most fertile Spots in the Kingdom.

Market-Towns.

Worcester is the Ca-	Droitwich, *f*	Parshore, *tu*
pital, *w, f,* and *f*	Stowerbridge, *f*	Tidbury, *tn*
Evesham, *m*	Kidderminster, *tb*	Upton, *tb*
Bewdley, *f*	Bromsgrove, *tu*	Shipton, *f*

Yorkshire,

Is a Maritime County, and much the largest in all *England*; it is divided into three Parts, called *Ridings,* viz. *North, East,* and *West:* 'Tis in general a plentiful County, abounding in Corn, Cattle, Fish, and Fowl, and famous for breeding fine Saddle-Horses. It is 320 Miles in Circumference, and contains 3770000 Acres; it sends great Quantities of Woollen Cloth to *London,* and elsewhere, being its chiefest Manufacture.

Market-Towns.

York is the Capital; Market-Days *Thursday* and *Saturday*; with 36 other Market-Towns, too numerous here to particularize.

The Principality of WALES.

*W*ALES was originally independent on *England,* but in the Reign of King *Henry* the VIIth, it was incorporated with it. This Country is very mountainous and barren, except in the Vallies and Intervals, where it yields Plenty of Grass and Corn. The Situation is Westward, bordering on the *Irish* Sea; the Air bleak and sharp, but wholsome; the Cattle are numerous, but very small; and on the Hills there are Goats in Abundance. This Country is divided into North and South, *viz.*

North-Wales,

Contains Anglesey, Carnarvonshire, Denbighshire, Flintshire, Merionethshire, and Montgomeryshire.

Anglesey is an Island in the North-west Part of the Country, about 80 Miles in Compass, and contains about 200000 Acres. It affords Plenty of Corn, Cattle, Fish, Fowl, and Mill-stones (for grinding of Corn) in abundance: It has but two Market-Towns, *viz. Beaumaris* and *Newborough*; *Wednesday* is the Market-Day of the first, and *Tuesday* of the latter.

Carnarvonshire is a Sea-coast County, 110 Miles in Compass, containing about 340000 Acres. It hath Plenty of Corn, Cattle, Fish and Wood; the Air is healthful, and the Soil good, especially the Western Part, which produces abundance of excellent Barley.

Market-Towns.

Carnarvon is the Chief, *ſ*	Pobell, *w*
Bangor, *w*	Aberconway, *ſ*
Krobich, *w*	Newin, *ſ*

Denbighshire is 116 Miles in Circuit, and contains about 410000 Ares. The Middle of this County hath Plenty of Rye, Coals, and Sheep; it hath also some small Lead-Mines; but the chief Part of it is a Valley called *Diffryn Cluid*, exceeding pleasant and fertile, adorned with several Gentlemen's Seats, and those of good Estates. *Denbigh* is the County Town, and the Market day on *Wednesday*. *Wrexham* is another of its principal Market-Towns, a pretty Town, and famous for its Market, neat Church, and lofty Steeple.

Flintshire contains about 160000 Acres, and is in Circuit 82 Miles. It hath but three Towns, *viz. Flint*, St. *Asaph*, and *Gairus*; the first so small, that it hath no Market. 'Tis a hilly Country, but the Vales are very fertile, and the Inhabitants commonly live to an advanced Age. Its Commodities are small Cattle, Butter, Cheese, Pit-coal, Lead, and Mill-stones. In this County is St. *Winifred*'s Well, so famous for curing Aches, Lameness, and as some say, for Propagation.

Merionethshire is 180 Miles in Circuit, and contains about 500000 Acres. The County in general is mountainous, but yet not without Plenty of small Cattle, and other Necessaries for the Inhabitants. The Chief Manufacture is Cotton Work. The principal Town is *Harlech*, which hath a pretty good Market on *Saturdays*.

Montgomeryshire is in Compass 94 Miles, and contains 560000 Acres. 'Tis fruitful, though mountainous, and h. th six small Market-Towns, but no Manufactures worth Notice.

South Wales,

Contains Brecknockshire, Cardiganshire, Carmarthenshire, Glamorganshire, Pembrookshire, and Radnorshire.

Brecknockshire is 106 Miles in Circuit, and contains about 620000 Acres, divided into Hills and Valleys; the first but

barren,

barren, but the latter very plentiful, wholesome, and pleasant. *Brecknock* is the chief Town, and hath a good Trade for Clothing ; it hath two good Markets in a Week, *viz.* *Wednesdays* and *Saturdays.* The Commodities are Cattle, Fish, and some small Quantity of Otters Furr.

Cardiganshire is 94 Miles in Compass, and contains about 520000 Acres. It is situated on the Bank of the *Irish* Sea, and hath Plenty of Corn, Cattle, Fish, Fowl, *&c.* Of late Years it is become remarkable for its Silver, Copper, and Lead Mines.

Carmarthenshire is one of the most plentiful Counties in all *Wales,* the Air good, and the Soil fertile. It affords Plenty of Corn, Cattle, Salmon, Wood, Pit-coal, and the best Lead, 'Tis 120 Miles in Compass, containing about 700000 Acres.

Glamorganshire is a very fine plentiful Country ; in the South Part it is so fruitful, that it is called the *Garden of Wales.* It is 112 Miles in Circuit, and contains about 540000 Acres. *Cardiff* is the County Town, which keeps two Market-Days weekly, *viz. Wednesday* and *Saturday.*

Pembrokeshire is a very pleasant and plentiful Country, for the most part surrounded by the Sea. It is 93 Miles in Compass, and contains about 520000 Acres. This Country is famous for a Harbour called *Milford-Haven,* and is justly esteemed to be in all respects one of the best in the World. *Pembroke* is the principal Town, whose Market is kept on *Saturday.*

Radnorshire is one of the most barren and unfruitful Counties in all *Wales.* It is in Circuit 90 Miles, and contains about 310000 Acres. The Assizes are usually kept at *Prestain* ; but *Radnor* is the Shire-Town, and hath a tolerable Market upon *Saturday,* and *Prestain* hath another on *Wednesday.*
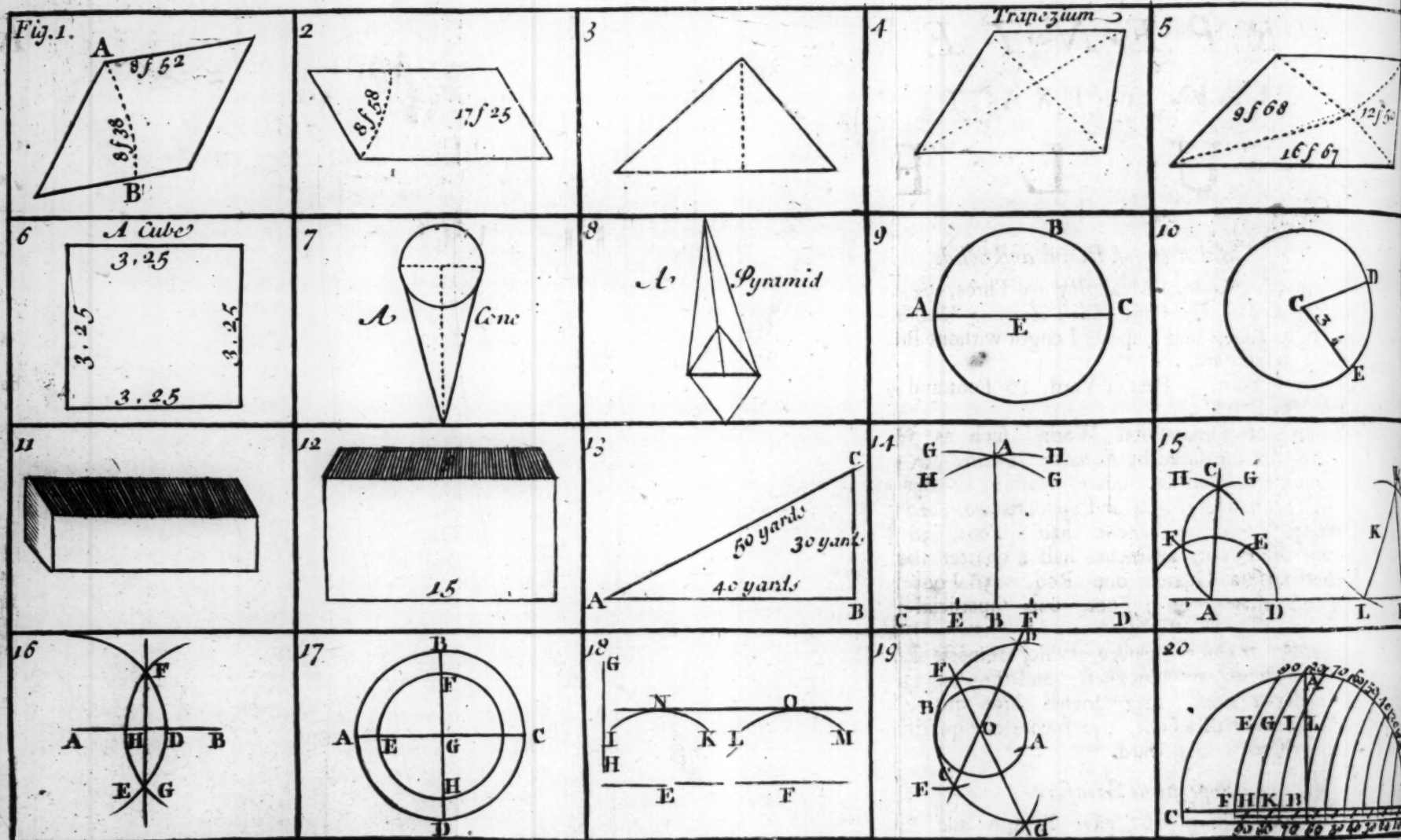
Fig.1. A 8 ∫ 52 8 ∫ 38 B

2 8 ∫ 58 17 ∫ 25

3

4 Trapezium

5 9 ∫ 68 12 ∫ 50 16 ∫ 67

6 A Cube 3, 25 3, 25 3, 25 3, 25

7 A Cone

8 A Pyramid

9 B A E C

10 D C 3 E

11

12 15

13 C 50 yards 30 yards A 40 yards B

14 G A H H G C E B F D

15 H C G K F A D L B

16 F A H D B E G

17 B F A E G C H D

18 G N O I H K L M E F

19 D F B O A G F D

20 90 80 70 60 50 40 30 20 10 E G I L F H K B C 10 20 30 40 50 60 70 80 90

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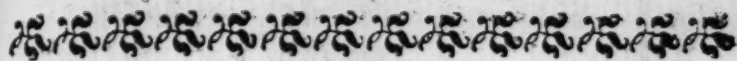
THE
C A R P E N T E R's
PLAIN and EXACT
R U L E.

Of Mensuration of Plains and Solids.

THE several Kinds of Measuring are Three, *viz.*

1*st*, *Lineal*, by some called *Running Measure*, and is taken by a Line, and respects Length without Breadth; the Parts of which are,

12 Inches 1 Foot, 3 Feet 1 Yard, 16 Foot and half 1 Rod, Pole, or Perch.

All Kinds of Ornamental Work, such as Cornice, Freeze, &c. are measured by *Running Measure.*

2*dly*, *Superficial*, or flat square Measure, is that which respects Length and Breadth; and the Parts are, *viz.*

144 Inches 1 Foot, 72 Inches half a Foot, 36 Inches one quarter of a Foot, 18 Inches half a quarter of a Foot, 272 ~~Inches~~ and a Quarter one Rod, 136 Foot half a *Feet* Rod; 1296 Inches, or 9 Foot, one superficial square Yard.

3*dly*, *Solid*, or Cube Measure, which respects Lengths, Breadth, and Depth, or Thickness; and the Parts are, *viz.*

1728 Inches 1 Foot, 1296 Inches three quarters of a Foot, 864 Inches half a Foot, 432 Inches one quarter of a Foot, and 27 Foot 1 solid Yard.

Superficial Measure.

TO measure Things that have Length and Breadth, such as Board, Glass, Pavement, Wainscot, and Land, is to take the Dimensions of the Length and Breadth, according to the customary Method used in each Particular; as Board and Glass are measured by the Foot, but the Dimensions are taken in Feet and Inches, and the Content given in Feet.

Wainscot

Wainscot and Paving by the Yard, as are also Plaistering and Painting, and the Dimensions are taken in Feet and Inches, and the Content given in Yards.

Dimensions of Land are taken by the Pole or Chain, of 4 Poles in Length; all which is taken in square Measure superficial, that is, an Inch, Foot, Yard, or Pole; which is not only sometimes in Length, but also as much in Breadth too; or if it wants of it one way, it must be made up the other.

Of the Square.

The squaring of any Number, is multiplying it into itself, as 12 Inches multiplied by 12 Inches, make 144 Inches square, on the flat. The Square of any Thing is found four several Ways, *viz.* by whole Numbers, by Decimals, by Practice, and by cross Multiplication; in each of which Methods I shall give Examples of Operation.

When any thing is to be measured, it must be considered what Form or Fashion it is of; and then it must be measured according to the several Rules for each Figure.

First, If it be a Square of equal or unequal Sides, that is, one way longer or wider than the other (as Boards are almost always much longer than they are broad,) then the Length and Breadth must be multiplied one by the other, which makes it square Measure as was hinted before; and if that Product be divided by its proper Divisor, as 144 is the Divisor for flat or superficial Measure, and 1728 the Divisor for Cube or solid Measure; the first being the square Inches in a superficial square Foot, and the other the cubic square Inches in a solid Foot square.

Example.

Admit a Board be 12 Inches broad, and 8 Foot or 96 Inches long; how many square superficial Foot doth it contain?

B.12 [L. 96]

$$\begin{array}{r} 96 \\ 12 \\ \hline 144)\ 1152\ (8\ \text{Foot.} \\ 1152 \\ \hline (0) \end{array}$$

Here the Length in Inches is multiplied by the Breadth in Inches, and the Product 1152 divided by 144, the square Inches in a Foot, quotes 8 Foot square for the Contents of the Board.

A General Rule for Dispatch,

If the Length of a Board, or Piece of Glafs, be given in Feet, and the Breadth in Inches, multiply one by the other, (without any Reduction) and divide the Product by 12, and the Quotient will be the Anfwer in Feet, and the Remainder will be Parts of a Foot. So the foregoing Example might have been fooner done by dividing 96 the Length, by 12 the Breadth, and it quotes 8 Foot for the Content, as by the former Way.

Example.

Suppofe a Board be 14 Foot long, and 15 Inches broad ; what's the Content in fquare Feet ?

    14 Foot long.
    15 Inches broad.

12) 210

Foot 17—6 $\frac{6}{12}$ or $\frac{1}{2}$.

So the Anfwer is 17 Foot and $\frac{1}{2}$. And fo for any other Example of this Kind.

Or concifer thus,

     14
by 1—3

     14
3 In $\frac{1}{4}$ 3 $\frac{2}{4}$ or $\frac{1}{2}$.

Anfwer 17 $\frac{1}{2}$

Here 3 Inches is the $\frac{1}{4}$ of a Foot, wherefore $\frac{1}{4}$ of 14 is taken, and added to 14, and it makes 17 Foot and $\frac{2}{4}$, equal to $\frac{1}{2}$.

If a Board be wider at one End than the other, then take the Breadth in the Middle, or add the Meafure of both Ends together, and take the Half for the mean Breadth, which multiply by the Length.

Example.

Suppofe a Board to be 120 Inches long, and the narroweft End 10 Inches wide, the broadeft End 34 Inches wide ; what is its Content in fuperficial Feet ?

Add

Add $\left\{\begin{array}{l} 34 \text{ broadeft End.} \\ 10 \text{ narroweft.} \end{array}\right.$

the   44
half   ——
is   22 the Medium:
     120 the Length.

---

144) 2640 (18 Foot $\frac{1}{3}$ *Anfwer.*
    144

    1200
    1152

Rem. $\dfrac{48 \mid 4 \mid 1}{144 \mid 12 \mid 3}$ or 4 Inches ; 48 the Remainder is $\frac{1}{3}$ of 144.

Or thus :

    Foot   Inches
    10——00 narroweft End.
     1——10 the mean Breadth.

    In. 10——00

For 10 In. $\left\{\begin{array}{l} 6\frac{1}{2} \ 5 ——00 \\ 4\frac{1}{3} \ 3 ——04 \end{array}\right.$

    18——04 *Anfwer.*

If a Board or Piece of Glafs be ever fo irregular, it may be meafured very near, by taking the Breadth in 5 or 6 Places, and add the feveral Breadths together, dividing the Total to the Number of Places, and the Quotient will be the mean Breadth ; which multiply by the Length, &c.

Having the Breadth in Inches of any Board, or Piece of Glafs, to know how much in Length of that Board, or Piece of Glafs, will make a Foot Superficial.

Rule. Divide 144 by the Inches in Breadth, and the Quotient will be the Length of that Board that will make a Foot.

Example.

If a Board be 9 Inches broad, what Length of that Board will make a fuperficial Foot.

                                       Or

Or by the Rule of Three Reverſe, thus,

9) 144

Inches | 16 *Anſwer.*

I.b.   I.l.   In.
If 12 give 12, what 9 broad?
12

9) 144

Anſwer 16 Inches.

If a Board be 12 Foot ½ long, and 15 Inches broad; how many ſquare Feet doth it contain?

VULGARLY.	DECIMALLY.
Inches.	12,5
150 long.	1,25
15 broad.	
	625
750	250
15	125
144) 2250 (15 Foot.	Foot 15,625
144	12
810	Inches 7,500
720	4
90	Quarters 2,000

Multiply by 12 Inch. 1 Foot.

144) 1080 (7 Inches.
1008

··72
by   4 ¼ in an Inch.

144) 288 (2 ¼ or ½.
283

···

By

By Cross-Multiplication.

Feet.	In.
12	6
1	3
12	0
0	6
3	0

Answer 15 —— 7½

By Practice.

Feet.	In.
12	6
1	3
12	6
3	1½

3 Inches ¼

Facit 15 —— 7½

Here the Content is found four several Ways, *viz.* by multiplying the Inches together, and dividing by 144, &c. The next Work is performed Decimally; the third Method is by Cross-Multiplication; and the last and best is by Practice.

Any of these Methods may be easily understood by the Use of the Arithmetical Part of this Book, except the Method by Cross-Multiplication, which, I think, hath not been shewn; wherefore I shall explain it here.

In the Example, 1 Foot 3, stands under 12 Foot 6; and having drawn a Line, say, once 12 is 12; then I say cross-way, 6 times 1 is 6 Inches; so that Line is 0 Foot 6 Inches: Then cross-ways again, I say 3 times 12 is 36 Inches, the 12's in 36 is 3 times, or 3 Foot; so that Line is 3 Foot 0 Inches; Lastly, I multiply the Inches together, saying, 3 times 6 is 18, the 12's in 18 once, and there remains 6, or ₁⁶₂, equal to ½, as in the Work.

Proper Directions for Joyners, Painters, Glasiers, &c.

Rooms being generally various in their Forms, take this general Rule in all Cases, *viz.*

Take a Line, and apply one End of it to any Corner of the Room: Then measure the Room, going into every Corner with the Line, 'till you come to the Place where you first began: Then see how many Feet and Inches the String contains, and set it down for the Compass or Round; then take the Height by the same Method.

Glasiers are to take the Depth and Breadth of their Work, and multiply one by the other, dividing by 144; Glass being measured as Board.

Having

Having thus shewn the Methods of casting up Dimensions, I come now to Particulars ; and the first of

Glasiers Woork, by the Foot.

If the Windows be square, multiply the Length by the Breadth, which will produce the Content, as abovesaid.

Examples.

A Window glazed by Cross Multiplication.

Foot. In.
8—9 high.
7—3 broad.

56—0
2—0

5—3
2 $\frac{1}{4}$

63—5 $\frac{1}{4}$ *Answer.*

Foot. In.
8—9
7 Foot 3

61—3
3 Inches $\frac{1}{4}$ 2—2 $\frac{1}{4}$

63—5 $\frac{1}{4}$ *Answer.*

If the Windows are arched, or have a curved Form, no Allowance is made by reason of the extraordinary Trouble, and waste of Time, expence or waste of Glass, &c. And the Dimensions are taken from the highest Part of the Arch, drawn to the Bottom of the Window, for the Height or Length ; which multiply by the Breadth, and the Product will be the Answer in Feet, &c.

Glasiers are often so very nice, as to take their Dimensions, and to measure to a quarter of an Inch.

Example
Foot. In.
4—3 $\frac{1}{2}$ long.
2 Foot 7 $\frac{3}{4}$ broad.

Inches is $\frac{1}{2}$	8—7
1$\frac{1}{2}$ is $\frac{1}{8}$	2—1 $\frac{3}{4}$ $\frac{1}{4}$
$\frac{1}{4}$ is $\frac{1}{48}$	6 $\frac{1}{4}$ $\frac{3}{4}$ $\frac{1}{4}$
	1 $\frac{1}{4}$

11—4 $\frac{1}{4}$ *Answer.*

Glass is measured by the Foot, as said before ; and the Price of Work is as follows ; *viz.*

English Glass *per* Foot ——— ——— o 5
French

French and Crown Glaſs	—— ——	1—0
Common Work, Leading included, for every Foot } ſquare —— ——		0—6
New Leading old Glaſs *per* Foot —— ——		0—3
Common Diamond Squares, each —— ——		0—1

Painters Work, *by the Yard.*

WHEN the Wainſcot of a Room is painted, you are to meaſure round the Room with a Line, (as hinted before) without girting the Mouldings, which are to be meaſured by a String, and added to the other ; then multiply the Compaſs by the Height, with the Addition of the Mouldings, &c. and you have the Content in Feet and Inches ; which reduced to Feet, bring into ſquare Yards by dividing by 9.

Example 1.

A Room painted.

Foot. In.

Being 45—8 in Compaſs, } What is the Content in ſquare
   10 Foot 6 high. } Yards ?

$$456—8$$
$$22—10$$

$$9)\ 479—6$$

Yards 53—2—6 *Anſwer.*

Example 2.

If the Height of a Room painted be 12 Foot 4, and the Compaſs 84 Foot 11 ; what ſquare Yards doth it contain? Anſwer, 116 Yards 3 Foot 3 ⅔.

Feet. In.
   84—11 Compaſs.
   12 F. 4 high.

In. 1019—00
4 ⅓ 28—03 ⅔

9) 1047—03 ⅔

Yds. 116—03—3 ⅔ *Anſ.*

Note, Double Work is allowed in Window-Shutters, Saſh-Frames and Mantlepieces are reckoned by themſelves, unleſs the Mantlepieces ſtand in the Wainſcot, and then they are to be meaſured as plain Work, deducting nothing for the Vacancy.

Prices.

	s.	d.
Common coloured, 3 Coats in Oil, *per* Yard	0	6
On old Colour	0	4
Walnut-tree Colour	1	0
Marble Colour, from 16 *d.* to	2	0
Sash-Frames, each	1	0
Sash-Lights, each	0	1
Window-Lights, one with another	0	3
Iron Casements	0	3

Joiners Work.

WAINSCOTTING, the Dimensions are taken as in Painting, *viz.* by measuring the Height (indenting the String where-ever the Plane goes, as well as the Painters do where-ever the Brush goes) and then the Compass; which multiply one into the other, dividing the Product by 9, and the Quotient is the Answer in square Yards.

Example.

What is the Content of a Piece of Wainscotting that is 9 Foot 3 long, and 6 Foot 6 broad?

Foot. In.

         6   The Length and Breadth
  9—3   being multiplied together,
    6 F. 6.   brings it into square Feet;
  ———   which divided by 9, (the
  55—6   square Feet in a Yard) pro-
In. ½ 4—7 ½   duces 6 Yards ⅔ for the
                 Answer, as *per* Margin.

9) 60—1 ½ (6 Yds ⅔ *Ans.*

  54
  ———
   6
  ———

By *Cross Multiplication, thus:*

Feet. In.

  9—3
  6—6

  54—0
   4—6
   1—6
   1 ½
  ———
  60—1 ½ as before, which divide by 9, &c.

Once

Once more.

There is a Room wainscotted, the Compass of which is
47 Foot 3 Inches, and the Height 7 Foot 6 Inches ; what's
the Content in Yards square ? *Answer* 39 Yards $\frac{1}{3}$.

Feet. In.		Or thus,
47—3 Compass.		Yds. In.
7 F. 6 the Height.		15—9
		2 Yds. 6
330—9		
6 In. $\frac{1}{2}$ 23 7$\frac{1}{2}$		31—6
	6 In. $\frac{1}{2}$ 7—10$\frac{1}{2}$	
9)354—4$\frac{1}{2}$		
	Answer 39—4$\frac{1}{2}$	

Answer 39 Yds $\frac{3}{9}$ or $\frac{1}{3}$.

The Prices per Yard.

	s. d.
For good Wainscot	6—0
Wainscotting, not finding Stuff, &c.	2—0
Course Wainscotting	1—0
Deal Wainscot, finding Stuff	3—0
Not finding Stuff	1—6

Carpenters Work.

ROOFING, Flooring, and Partitioning, the princi-
pal Carpentry in modern Building, are measured by
the Square of 10 Feet each Way, that is 100 square Feet.

For Roofing, multiply the Depth and half Depth, by the
Front ; or the Front and half Front by the Depth, and
you'll have the Contents.

The Dimensions are taken in Feet and Inches.

Example.

How many Squares doth that Piece of Work contain that
measures 199 Feet 10 Inches in Length, and 10 Feet 7 In-
ches in Height ? Answer 21 Squares 14 Feet 10 Inches $\frac{3}{4}$.

Operation.	This Work is done by
Feet. In.	cutting off two Places to-
199—10 long.	ward the Right Hand,
10 F. 7 high.	and the Number on the
	Left are Squares, &c.
1998—4	
6$\frac{1}{2}$ 99—11	
1$\frac{1}{12}$ 16—7$\frac{3}{4}$	

21|14—10$\frac{3}{4}$ *Answer*, 21 Squares, 14 Feet 10 Inches $\frac{3}{4}$.

Again

Again.

If a Floor be 49 Feet 7 Inches 4 Parts long, and 26 Feet 6 Inches broad ; how many ſquare Feet ?

The Operation by Croſs Multiplication.

Feet.	In.	Parts.
49	7	4
26	6	0
294	0	0
980	0	0
15	2	0
24	6	0
	3	6
	8	8
	0	2
13	14	8	4

Anſw. 13 Squ. 14 Feet, 8 Inch. 4 Pts.

Note, *In meaſuring Roofing, no Deduction is made for Sky-Lights, Chimney-Shafts,* &c.

In meaſuring Flooring, take the Dimenſions of the whole Floor at once in Feet, and then meaſure the Content in ſuperficial Feet of the Vacancy for the Stairs, Hearths, &c. which deduct from the whole Floor, and the Remainder is the true Content ; which bring into Squares as before.

Note, *In Partitioning, you muſt meaſure the Doors, Door-caſes, and Windows by themſelves, and deduct their Content out of the Whole ; except by Agreement they are included; and then you muſt mention in the written Agreement, Doors, Door-caſes, and Windows included*

There are divers Sorts of Carpenters Work belonging to a Building, *viz.* Cantaliver-Cornice, Modilion-Cornice, Plain-Cornice, Guttering, Rail and Balluſters, Lintale, Penthouſe-Cornice, Timber-front Story, Breſt-ſommers, Shelving, Dreſſering, &c. all which are meaſur'd by Lineal or Running Meaſure. There are alſo Doors and Door-caſes, Lanthorn-Lights with their Ornaments, Balcony-Doors and Caſes, Cellar-Doors and Curbs, Columns and Pilaſters, Cupola's, &c. all which are valued by the Piece.

Carpenters Work is done at the following Prices, viz.

	l.	s.	d.
Flooring, finding Boards, the Square	1	15	0
Not finding Boards, from 2s. 6d.	0	06	0

Roofing

Roofing with Oak		2—00 0
Not finding Timber		0—12—0
Partitioning *per* Square		0—15 0
Not finding Timber		0—07—6
Stairs with Rails and Ballusters compleat		1—10—0
Sawing of Oak and Elm *per* 100 Foot		0—02—6
Fences for Trees		0—02—0

Oak Timber is commonly fold for 40 *s. per* Tun, that is 40 Foot fquare) in the Place ; Afh 30 *s.* and Elm 28 *s. pe* Tun.

Note, *Carpenters meafure the Timber Frames of any Build-ing (which they call the Carcafe) by the Square of 10 fuper-ficial Meafure, or 100 fquare Feet, as hinted before.*

Bricklayers and Tylers Work.

Of Walling.

WALLING is meafured by the Rod Statute-Mea-fure, being 272 Feet and $\frac{1}{4}$ fuperficial. The Me-thod of taking their Dimenfions is thus : For a Wall round an Orchard or the like, they meafure the Length by a Line, going over the Buttreffes ; and for the Height, they meafure over the Mouldings (preffing the Line into them) even to the Middle of the Coping : They likewife take No-tice of the Thickneſs of the Wall, that is, how many half Bricks in Length the Wall is in Thickneſs ; for three half Bricks, that is, a Brick in Length, and one in Breadth, is Standard Thickneſs : And all Walls, whether leſs or more, muſt be reduced to that Thickneſs, by this Rule, *viz.* Mul-tiply the Product of the Length and Height, by the Num-ber of half Bricks that the Wall is in Thickneſs ; which Product divide by 3, and then the Quotient by 272 (the $\frac{1}{4}$ being generally neglected in vulgar Working) and the Quo-tient will be Rods, at a Brick and half thick Standard Measure.

Example.

Admit the Face of the Wall meafure 4085 Feet, and the Thickneſs be two Bricks and half, or five half Bricks thick, how many Rods doth it contain ?

$$4085$$
$$5$$
$$3) \overline{20425}$$

$$272) \quad 6808 \; (25 \text{ Rods, } Answer.$$

$$\overline{1368}$$

$$(8)$$

When the Work is wrought Decimally, then you divide by 272 $\frac{1}{4}$, or 272,25, which gives the Quotient somewhat less. But the Measuring of Brick-Work may be shorten'd by having the Rod of 16 Foot $\frac{1}{2}$ centesimally divided into 100 equal Parts, with which you take the Dimensions, and the Length of the Wall in those Rods; and 100 Parts, multiplied by the Height, give the Content in Rods, of any Wall that is a Brick and half Thick. Deduction must be made for Doors, Windows, &c.

A Table to reduce Brick-Work to Standard Measure, *i. e.* Brick and half thick.

Brick.

$$\left. \begin{array}{l} 1 \quad \text{Subtract } \frac{2}{3} \\ 2 \quad \text{Add } \frac{1}{3} \\ 3 \\ 4\frac{1}{2} \\ 5 \end{array} \right\} \text{Mult.} \left\{ \begin{array}{l} 2 \\ 3 \\ 4 \end{array} \right\} \text{Reduces to a Brick and half.}$$

Example.

Suppose a Garden Wall to be 254 Foot round, and 12 Foot 7 Inches high, and three Bricks thick; how many Rods doth it contain?

$$254$$
$$12$$
$$\overline{\quad}$$
$$3048$$
$$127$$
$$21-2$$
$$\overline{\quad}$$
$$3196-2$$
$$\text{——— Rods.}$$
$$272)6392-4(23, \&c.$$

In this Operation, the Aggregate, or Total, is multiplied by 2, because twice 3 is 6, the Number of half Bricks; and that reduces the Work to Standard-Measure, as by the Table above.

Of Chimnies.

This Brick-Work is commonly agreed for by the Hearth,
and also sometimes by the Rod ; and the Method of taking
Dimensions is thus : If the Chimney stands singly, not lean-
ing against, or being in a Wall, and worked upright over
the Mantle-tree to the next Floor ; it is girt about the Breast
for the Length, and the Height of the Story is taken for
the Breadth, and the Thickness of the Jaumbs for the Thick-
ness. But if the Chimney stands against, or in a Wall
which is before measured with the rest of the Building ; then
the Breadth of the Breast or Front, together with the Depth
of the two Jaumbs, is the Length ; the Height of the Story
the Breadth, and the Thickness of the Jaumbs the Thick-
ness. But if the Chimney stands in the Corner of a Room
and have no Jaumbs, then the Breadth of the Breast is the
Breadth, the Height of the Story the Length, and the Thick-
ness the Thickness. And for the Shaft, it is commonly girt
in the smallest Part, for the Length ; and the Thickness of
both Sides, for the Thickness ; in Consideration of the
Widths, Pargiting, Scaffolding, &c.

Note, *There is nothing to be deducted for the Vacancy be-*
tween the Hearth and the Mantle-tree, because of the Width
and the Thickening for the next Hearth above.

Arches are measured by taking the Breadth and half the
Breadth of the Arch, and add them together ; and then
multiply the Total by the Length, for the Content in Thick-
ness of the Arch.

Gable Ends.

Take half the Perpendicular for the Breadth, and the
Width of the House for the Length ; or half the Width of
the House for the Breadth, and the Perpendicular for the
Length : which brings the Measure to an Oblong, which
is easily measured by multiplying the Length by the
Breadth, &c.

Note, *A Perpendicular is a down or upright Line in the*
Work thus | *: There are several other Things in Bricklayers*
Work ; as Cornice, Facias, Streight Arches, Scheme Arches,
Hips and Valleys in Tiling, and Water-Courses : All which
are measured by the Foot-Lineal, or Running Measure. As
Peers, Pilasters, Rustick Work, &c. which are valued by the
Piece.　　　　**Prices.**　　　　*l.　s.　d.*

For Walls, finding Materials　——　5—00—0 *per Rod,*
　　Not finding Materials　——　——　1—10—0 *ditto,*

Prices.	*l.*	*s.*	*d.*	
For Tyling, finding Materials	1	05	0	*per* Square.
Not finding Materials	0	05	0	ditto.
For Tyling, finding Materials, (except Tiles) that is 15 Foot square	0	10	0	*per* Rod.
For stripping without taking down	0	05	6	ditto.
With taking down	0	07	0	ditto.
For Pointing	0	02	0	ditto.

Paving.

Pavement for Cellars, Wash-houses, &c. is measured by the Square Yard.

Example.

If a Cellar, Wash-house, or Court-yard be paved with Bricks, or pitched with Pebble, being 9 Yards 2 Foot long, and 6 Yards 2 Foot broad ; how many Yards square doth it contain ? *Answer*, 64 Yards 1 and $\frac{1}{4}$ Feet, as by the following Work.

Yds. F.					*Yds.* F.
9—2					9—2
6—2					6 Yards 2.
54—0					54—0
6—0					3—8
4—0					3—8
1 $\frac{1}{4}$					64—1 $\frac{1}{4}$
64—1 $\frac{1}{4}$ *Answer.*					

Foot.
29
20

9) 580

ards 64 $\frac{4}{9}$

Here the Answer is found by three different Operations, and the Result of each, to the same Amount, *viz.* by Cross-Multiplication, by Practice, &c.

Slating.

Is valued by the Square of 10 ; in some Places by the of 18 Foot square ; that is 36 square Yards, or 324 Feet. In Tyling and Slating, where there are Gutters and leys, there is commonly an Allowance, which is to take

L the

the Length of the Roof all along upon the Ridge, which makes the Gutter double Meafure ; which in fome Places is allowed, in others not. Sometimes there is an Addition for hollow Ware, that is, Ridge Tiles, Gutter Tiles, Corner and Dormar Tiles ; and here Cuftoms differ : For in fome Places they account one fuperficial Foot for every Foot lineal or running Meafure ; then 100 Foot lineal is reckoned a Square. In other Places, for every 100 of fuch Tiles they reckon one Square.

Plaftering,

Is of two Kinds, *viz. Firft*, Work lathed and plaftered, fometimes called Ceiling. *Secondl;*, Plaftering upon Brick-Work, or between the Quarters in Partitioning, by fome called Rendering ; both which are meafured by the Yard fquare, as the Joiners and Painters do. In taking Dimenfions of Ceiling, if the Room be wainfcotted, they confider how far the Cornice bears into the Room, by putting up a Stick perpendicular to the Ceiling, clofe to the Edge of the uppermoft Part of the Cornice ; and meafure the Diftance from the perpendicular Stick to the Wainfcot ; twice which Diftance muft be deducted from the Length and Breadth of the Room taken upon the Floor, and the Remainder is the true Length and Breadth of the Ceiling : As fuppofe a Floor is 24 Foot long, and 18 Foot broad, and the Cornice fhoots out 6 Inches ; deduct a Foot for both Ends, and the Length of the Ceiling is 23 Feet ; and the fame for the Breadth ; it leaves 17 Foot broad ; which, (if the Room be fquare) multiplied together, the Content is 419 Foot 12 Inches, and 46 Yards and a half.

Example.

If the Ceiling of a Room be 19 Foot 10 one way, and 17 Foot 6 the other, how many fquare Yards does it contain ?

$$23 \text{ Feet the Length.}$$
$$17 \text{ Feet broad.}$$

$$161$$
$$23$$

$$9) 391 .(43 \text{ Yards, } 4 \text{ Foot.}$$
$$36$$

$$31$$
$$27$$
$$4$$

N.

N. B. Fewer Figures, by Cross Multiplication, thus:

$$19 : 10$$
$$17 : 6$$

$$133$$
$$19$$
$$14 : 2$$
$$9 : 6$$
$$5$$

---

9) 347 : 1 (38 Yds. 5 Feet 1 Inch.

Example 2.

How many Yards square is there in a Piece of Plastering that is 47 Foot 4 Inches 7 Parts long, and 18 Foot broad?

F.   I. Pts.
47——4——7
     3 and 6.

142——1——9
       6

9) 852—10—6 (94 Yds. 6 Feet, 10 Inch. 6 Parts. *Answer.*

In measuring Partitioning for Doors, Windows, and other Vacancies, there must be an Allowance or Deduction made, they being Deficiencies.

Prices per Yard.

	s.	d.
For every Yard of common Plastering, finding Laths, Nails, &c.	0	9
Not finding Laths	0	4 ½
For White-washing with Size	0	1 ½
Partitioning, finding all Materials	0	8

Masons Work.

THE Masons Work, consisting of Stone, is of two Sorts, *viz.* Superficial and Solid. Pavement, and the Face of Stone Walls, Houses, &c. are measured as Brick-work. If the Work have Ornaments, as Capitals, Pillasters, Rails and Ballasters, &c. then they are valued by the Piece.

	s.	d.
For every Foot of Plain Work in Walls, &c.	0	8
For plain Cornice, about	1	5

For rough Stone Wall, with Lime, 16 Foot ½ long, } 1—2
    and 1 Foot high, *per* Rod ——————————
Without Lime, *per* Rod ——————————— 0—3
Paving, digging the Stone, and all Workmanship, *per* } 0—3
    square Foot ————————————————

Prices of Stone and Urns.

Rough Paving 1 *d. per* Foot; Rough Asher, or Coping 1 *d.*
½ *per* Foot; Fine Asher 3 *d. per* Foot; Base *per* Foot 4 *d.*
Carbe *per* Foot 6 *d.* Urns 3 Foot high 1 *l.* 4 Foot high 1 *l.*
10 *s.* five Foot high 2 *l.* and 6 Foot high 3 *l.*

Land Measure.

LAND is usually measured by the Acre. The Dimensions are taken with a Chain of four Poles in length, and is divided into 100 Parts, called *Links*, whereof 10 square Chains make an Acre. Let them be 10 in length and 1 in breadth, or 5 in length and 2 in breadth, *&c.* or 160 square Poles; but to find its Content (if not regularly square) it is generally contrived into Triangles, as a Piece of Land of 4 Sides (if not square) may be contrived into 2 Triangles, and Pieces of 5 Sides 3, and a 6 sided Piece into 4 Triangles.

To measure a Triangle.

Admit the longest Side of the following Triangle, *viz.* A D to be 76 Poles in length, and the perpendicular or dotted Line B C to be 30 Poles; multiply 76 (the Base) by 15, the half of the Perpendicular B C, and it produces 1140; Or if you multiply the whole Perpendicular by half the Base, (or longest Side) it will produce the same; which divided by 160, (the square Poles in an Acre) the Quotient gives the Content of that Piece of Land in Acres; and what remains multiply by 40, and divide by the same Divisor, and it quotes Roods, *&c.*

Note, *Always the Perpendicular is drawn from the next opposite Angle to the Base, or longest Side, as in the following Figure.*
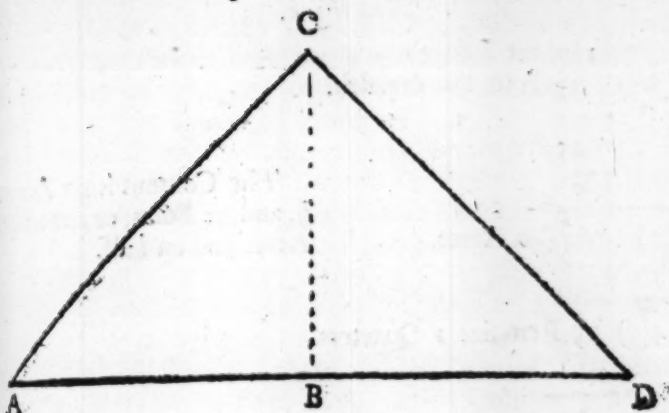
The Operation.

76 The Base.
15 Half the Perdendicular.

———————

16|0) 114|0 (7 Acres, $\frac{2}{16}$, or $\frac{1}{8}$.
112|0

———————

2|0

All other Pieces of Land (for the moſt part) muſt be brought into Triangles, and ſo meaſured, and their Contents added together.

Example.

Suppoſe a Plat of Ground contains 35 Poles broad, and 18½ Poles long; how many Acres is the Content?

Rule.

Multiply the Length in Poles by the Breadth into ditto, and divide the Product by 160, (the ſquare Poles in an Acre) and the Quotient will be the Anſwer in Acres : and if any thing remains, divide again, either

By $\begin{Bmatrix} 120 \\ 80 \\ 40 \end{Bmatrix}$ and the Quotient is $\begin{Bmatrix} \frac{3}{4} \\ \frac{1}{2} \\ \frac{1}{4} \end{Bmatrix}$ of an Acre.

L 3

The

The Work.

185 the Length.
35 Poles the Breadth.

————

925
555

——————
16|0) 647|5 (40 **Acres.**
64

————

4|0) 75 Remains 1 Quarters.
4

————

35 Poles remain.

The Content is 40 Acres,
¼, and 35 Poles, or almost 40
Acres and an half.

The Four Pole Chain.

Example. There is a Plat of Ground that contains 16
Chains and 25 Links in breadth, and 57 Chains and 30
Links in length; what is the Content of that Piece of Land?

C. Link.
57,30 Length.
16,25 Breadth,

————————
28650
11460
34380
5730

————————
Acres 93|11250 cut off 5 Places.
4

————————
No Roods ,45000
40

————————
Poles 18|00000 (93 Ac. 0 Rod, 18 Poles. *Anf.*

Note, 4 Roods or Rods is 1 Acre, 40 Poles 1 Rood or
Rod, 1 Rood or Rod 1 Quarter of an Acre.

Note also, *Gunter's* Chain contains 4 Statute Poles in 100
Links, so that any Number of Chains are no more than so
many 100 Links, as 4 Chains are 400 Links, and 6 Chains
600

600 Links, &c. 160 Statute Poles are an Acre, each Pole being 16 Foot and half ; therefore, in a square Chain there are 16 square Poles ; and if you divide 160 (the square Poles in an Acre) by 16, (the square Poles in a Chain) the Quotient is 10, the square Chains in an Acre.

A square Chain contains 10000 square Links, (or 100 multiplied by 100) and therefore it follows consequently, that an Acre contains 100000 square Links.

To reduce Statute to Customary Measure.

According to a Statute made in the 33d of *Edward* the First, and another in the 25th of Queen *Elizabeth*, a Statute Pole is 16 Foot and half long, (as said before) but in divers Parts of *England* there are used Poles of 18, others of 21, and some of 24 Foot long, called Customary Measure, being in Use according to the Humour or Custom of the Place where they are taken. To turn therefore one Sort of Measure into the other, admit Statute Measure to be turned into Customary, do thus : Multiply the Number of Acres, Roods, and Poles Statute Measure, by the square half Yards, or square half Feet in a square Pole of Statute Measure, and divide the Product by the square half Yards, or square half Feet contained in a Pole of the Measure Customary, and the Quotient gives the Answer in the latter, in Acres, Roods, &c.

Example. In 272 Acres Statute Measure, how many Acres of 18 Foot to the Pole or Perch?

> *Acres.*
> 172 Statute Measure.
> 121 half Yards in a Statute Pole.

Product 20812 (144 Acres $\frac{76}{144}$ *Customary Measure.*
    144
    &c.

In a Statute Pole are 11 half Yards, which squared make 121 square half Yards : and in a square Pole of 18 Feet are 144 square half Yards, &c. For the Remainder, work as before, *viz.* by multiplying it by 4, &c. and the next Remainder by 40, &c. as spoke to before : So that the Answer is, that 172 Acres Statute Measure make, by the foregoing Operation and Direction, 144 Acres, 2 Roods, and 4 Poles Customary Measure, of 18 Foot to the Pole.

One Example more per Contra.

In 543 Customary Acres of 18 Foot to the Pole, how many Acres of Statute Measure, being 16 Foot and half to the Pole.

543 Customary.
144 Square half Yards in a Customary Acre.

2172
2172
543

721) 78192 (646 Statute Acres.
796
55, &c.

The Remainder 26 multiplied by 4, produces 104, which are not a Rood; which multiplied by 40 gives 4160; which divided by 121, quotes 34 Perches, and 46 remains. So the Answer is, that 543 Customary Acres, of 18 Foot to the Pole, make 646 Acres or Roods, and 34 Poles, $\frac{46}{121}$ of a Pole.

Note, Customary Acres, as well as Statute Acres, contain 160 square Poles or Perches; the Excess of Bigness is by the Bigness of the Pole.

Solid Measure.

IS that of Timber, Stone, Digging, and Liquids; and the Rule for Working is to multiply the Length and Breadth together, and then that Product by the Depth or Thickness, and the last Product will be the Content in Cubick Inches, which if Timber or Stone, divide by 1728, (the Cubick Inches in a Foot solid) and the Quotient gives the Content in solid Feet.

Example. If a Tree be 16 Foot long, and 18 Inches square; how many solid Feet doth it contain?

Multip. { 18   16
         18   12

324   192 the Length.
                324 Breadth and Thickness.

                768
                384
                576

1728) 62208 (36 Feet.
      5184

      10368

(o)

Decimally.	By Practice.
Square $\begin{cases} 1,5 \\ 1,5 \end{cases}$	1—6
	1—6
225 Breadth	1—6
16 Length	6 In. $\frac{1}{2}$ 9
36,00 *Anſwer.*	2—3
	4 and 4
	9—0
	Foot 36—0 *Anſwer.*

Solid Feet.
Note, 40 of round } Timber is a Tun or Load.
50 of hewn }

Diviſors.
1728 for Timber or Stone.
27 for Digging.
282 for Beer.
231 for Wine.

Example 2.

Suppoſe there is given a ſquare Piece of Timber, whoſe Breadth is 2,25, and Thickneſs 1,64 Feet, and Length 36,5 Feet, how many ſolid Feet are contained therein ?

2,25 Breadth.
1,64 Thickneſs.

900
1350
225

36900
36,5 Length.

184500
221400
110700

134,68500 *Anſwer* 134 ſolid Feet.

The

The common Way of taking $\frac{3}{4}$ of the Compaſs for the true Square of it is erroneous, and gives the Solidity ſomewhat leſs than the true Content : But the true Way is to multiply half the Diameter by half the Compaſs, and then that Product multiply by the Length, which divide by 1728, and the Quotient is the Content. If you cannot come to meaſure the End of the Piece, you may know the Diameter by this Proportion, *viz.* as 22 is to 7, ſo is the Compaſs to the Diameter. Or you may find the Square of a round Piece of Timber by this Rule, *viz.* multiply by the Inches of the Compaſs, and cut off 4 Figures to the Right-hand.

```
                2821
        Inch.  66 the Compaſs.
              ──────
               16926
               16926
              ──────
         18|6186  Anſw.  18 Inches.
              ──────
               10000
```

Having the Breadth and Depth of a Piece of Timber or Stone, to know how much in Length of it will make a ſolid Foot; multiply one by the other, and let it be a Diviſor to 1728, thus :

```
    Inches
       24 broad
       18 thick
      ──────
       192
        24
      ──────
   432) 1728 (4 Inches in Length, Anſwer.
        1728
```

And thus you may make a Table to ſerve all Breadths and Depths, by which, much Labour may be ſaved in multiplying and dividing, and yet meaſure any Piece of Timber thereby very exactly.

The uſual Way for tapering Timber, is by this Method, *viz.* take the Dimenſions in the Middle, and multiply that by the Length ; which, though ſomewhat falſe, yet, if done at ſeveral Lengths, as at every 5 or 6 Feet, it will be very near.

Digging.

IS meaſured by the ſolid Yard of 27 Foot ; that is, 3 times 3 is 9, and 3 times 9 is 27 ; by which are meaſured

fured Vaults, Cellars, Clay for Bricks, &c. Other Things are meafured by the Flore of 324 folid Feet.

Example.

If a Vault or Cellar be digged 9 Foot deep, 4 Foot ½ long, and 3 Foot 9 Inches broad ; what is its Content in folid Yards ?

                    Foot.
                    4 ½ long
                      9 deep
                  ――――――――
                  40 ½
                      3 F. 9 broad.
              ――――――――――――
              121 ½
    6 Inches ½ 20 ¼
    3 ½ of 6 10
          ――――――――――――
          27) 151 ¾ (5 Yards 16 Foot ¾.
          ――――――――――――
              (16)

Example 2.

How many Yards of Digging will there be in a Vault that is 25 F. 4 long, 15 F. 8 broad, and 7 F. ½ deep.   *per* 3 and 5 F. 8.

                76―0
                    5
            ――――――――――
            380―0
                8―5 ¼
          ⅔ 8―5 ¼
            ――――――――――
            396―10 ½
                    7 F. ½ deep.
        ――――――――――――
        2778―1 ½ ¼
    ½ 198―5 ¼
    ――――――――――――
    27) 2976―6 ¾   (110 *Yards,* 6 *Foot, and* 6
    ――――――――――――   *Inches,* ¾ *Anfwer.*
            27
          (6)

Ex-

Example 3.

There is a Mote that is 648 Foot long, 24 Foot broad, and 9 Foot deep; how many Flores?

$$648 \text{ long}$$
$$24 \text{ broad}$$

$$2592$$
$$1296$$

$$15552$$
$$9$$

divide by 324) 139968 (452 *Flores*; *Answer.*
&c.

(o)

Solid Bodies being frequently painted, it is neceffary to know how to find their Superficiality: To find the fuperficial Content of a Square, or many fided or round Pillar; multiply the Sum of the Sides or Circumference by the Height in Feet; and the Product divided by 9, the Quotient will be all fquare Yards.

Of a Globe.

Multiply the Circumference in Feet by itfelf, and then that Product by this Decimal ,0354, and this laft Product will be the Content in Yards.

Note, A folid Yard fquare of Clay will make about 7 or 800 Bricks; and the Price of making is 7 or 8s. a Thoufand, 3 Bags (or Bufhels) and half of Lime, and half a Load of Sand, to laying 1000 Bricks.

500 Bricks
1000 Plain Tiles } made a Load.
25 Bags 1 C. of Lime,

IT may not here be improper, as well for refrefhing the Memory, as for improving the Underftanding, and forming the Mind with proper Notions and Ideas of Meafuring, to give a fhort Repetition by demonftrative Geometrical Figures, to explain what hath been verbally and arithmetically before expreffed.

And firft for *Planometry,* or *fuperficial* or *flat Meafure;* fome of which is meafured by the Foot fquare; as are Boards, Glafs, Marble, Freeftone and Pavements. The Dimenfions are taken in Feet and Inches, and the Content given in fquare Feet.   *Ex-*

Example 1.

Suppose there is an Oblong, or long Square, let it be
Board, Glaſs, or Pavement, &c. that contains on the
longeſt Side (or the Length) 24 Feet and half, and the
ſhorteſt Side (or Breadth) 14 Foot and ¼, as in the following
ing Figure, *viz.*
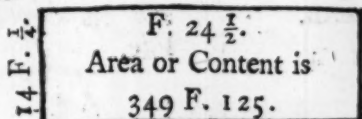
```
      ┌──────────────────────────┐
 14 F.¼│       F. 24 ½.          │
       │   Area or Content is    │
       │      349 F. 125.        │
       └──────────────────────────┘
              14,25 Breadth.
              24,5 Length.


                 7125
                 5700
                2850
              ──────────
              349,125
```

Rule. Multiply the Length by the Breadth, and cut off
as many Places to the Right-hand as their are Decimals in
the Length and Breadth.

Example 2.

Suppoſe a Board or Piece of Glaſs be in the Form of *Fi-
gure the Firſt*, called a Rhombus, that is in the Shape of a
common Pane of Glaſs, or Diamond ſquare.

Rule. To meaſure which, multiply the Breadth, *A B*,
by the Length of any of the Sides, (for they are all equal)
and cut off as many Places to the Right-hand as there are
Decimal Places in both Multiplicand and Multiplier, as
hinted before : As ſuppoſe the Breath *A B*, 8 Foot, 38 Parts,
and the Length of the Side to be 8 Foot, 52 Parts ; then the
Work will appear thus :

F. P.   Here the Multiplication is as in
8,52   whole Numbers, and the Content
8,38   or Anſwer is found to be 71 ſquare
──────   Feet, and $\frac{3976}{10000}$ ten Thouſands of
6816 A········B a Foot, or 4 Inches ¼.
2556
6816
──────
71,3976

3976 is ſeparated by a Comma, as above directed, and
are ſo many 10000 Parts of a Foot, as in the Work and
Margin expreſſed.

Ex-

Example 3.

Again, admit a Piece of Measurement to be of the Form of *Figure the Second*, called a Rhomboides; its Length 17 Foot 25 Parts, and its Breadth 8 Foot 58 Parts.

F. P.

17,25 Length.   The fore-mentioned Figure
8,58 Breadth.   hath its opposite Sides equal
                  and its opposite Angles a-
                  like.

13800
8625
13800
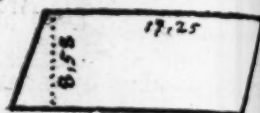
148,0050   *Answer*, the Content is 148 Feet.

Once more.

Suppose a Board, Piece of Glass, Pavement or Piece of Land, to represent, or be in the Form of a Triangle, or three-corner'd Figure, expressed as in the Shape of *Figure the Third*. Every Triangle is half a long Square, whose Length and Breadth is equal to the Perpendicular and Base.

Note, The dotted Line is the Perpendicular, the bottom Line the Base, and the Line from the Top of the Perpendicular to the left Angle of the Base, is call'd the Hypothenuse.

The measuring of a Triangle hath been already shewn, and therefore I shall desist speaking any further thereto.

The *Fourth Figure* is called a Trapezium, and consists of 4 Sides: This Figure, before it can be measured, must be divided into two Triangles, thus; *viz.* by 2 Lines drawn from one Angle or Corner, to the Angle opposite to it, as in the Figure.

Example 4.

Suppose the Dimensions of the Trapezium before described to be, *viz.* the Base 16 F. 76; the one Perpendicular 12 F. 50, and the other 9 F. 68 (as in Figure 5.) what's the Content?

The Operation. ✳

F. P.

One Perpendicular 12,50 } add
The other   9,68 }

The Sum is   22,18

The half Sum is 11,9, which

multiply by the whole Base 86,67

produces 184,8703

which is 184 Feet, and $\frac{8703}{10000}$ of a Foot, equal to 10 Inches and half.

✳ *This Operation is wrong, as the Reader will easily find, by multiplying the half of the sum of the Perpendiculars, by the Base of each Triangle.*

Note, If two Sides of a Trapezium are parallel, that is, the Lines equal; then add them together, and half the Sum multiplied by the nearest Distance between those two Sides, give the Content. Or if you measure it in the Middle between those two Sides or Lines that are of equal Length, the Answer will be the same.

Note also, Painting, Plastering, or any other irregular Pieces of Measurement, if in the Form of a Triangle, or if not, if divided as above, may be measured *ut supra*; and brought into Yards (if the Content is to be so given in) by dividing by 9, as before shewn.

Glasiers Work.

It may be done thus; Multiply the Length in Inches and Parts, by the Breadth in Inches and Parts, and separate for the Decimals (if any) as before shewn.

Example.

In. Pts.

A Piece of Glasing   29,5 long
and   7,0 broad

144)   206,50 1,5   So the Content is 1 f. 5,
      144   and $\frac{1}{8}$ of an Inch.

12) 62 (5
    60

(2)

Here, after the two Places are separated by a Comma, the Remainder is divided by 144, and then what remains by 12, &c.

Or thus, as if Shillings and Pence.

s.   d.
2—5 $\frac{1}{4}$
   7
         F. I.
12) 17—0 $\frac{3}{4}$ (1   5 $\frac{1}{4}$ Answer.

An Expeditious Way.

When the Length of any Superficies, either of Board or Glass, is given in Feet, and the Breadth in Inches, then only multiply the one by the other, and divide by 12, and the Quotient will be the Answer in Feet, and the

Re-

Remainder will be the Parts of a Foot ; as hath been spoken of before.

Example.

Admit a Board to be 15 Foot long, and 12 In. broad.
12 Inches broad.

----

12) 180 (15 Foot Answer.

Of Regular Figures.

THere are four Kinds, namely the Pentagon of five Sides, the Hexagon of six, the Heptagon of seven, and the Octogon of eight Sides ; all which derive their Names from the *Greek.*

To Measure any of these Bodies, is by dividing them into Triangles ; which is done by drawing Lines from the Centre of the Figure to every Angle or Corner ; then from the Centre to the Middle of any of the Triangles Sides, draw a Line ; which Line is the Perpendicular. Having the Perpendicular and Base of any of these Triangles, find the Content of one Triangle, and that multiplied by the Number of Triangles, finds the Content of the Body, or Figure.

Note, *To find the Centre or Middle of any Regular Figure of an even number of Sides, draw a Line from one Angle or Corner to its opposite, the Middle of which is the Centre; but if your Figure have any odd Number of Sides, as 5 or 7, &c. draw a Line from any Angle to the Middle of the Side opposite, the Middle of which Side is the Centre.*

Of Solid Measure.

SOlid or Cube Measure hath been already defined, (as well as Superficial Measure,) some of the Figures of which are number'd 6, 7, and 8.

To measure a Solid in form of a Cube, which hath Length, Breadth, and Thickness all equal, you must multiply these into themselves ; and the last Product gives the Solidity or Content, either of Wood or Stone. A Cube hath 6 Sides, and is in Shape like a Dye.

Example.

Example on the Cone, Decimally without dividing by 728.

$$2,5 \atop 2,5 \Big\} \text{ the Diameter}$$

12,5
50
___
6,25 the Square of ditto
,785
___
3125, &c.
___
4,90625
3,5 the ⅓ of the Altitude.
___
2453125, &c.
___
17,171875 the Content in solid Feet.

The Cone is measured by multiplying the superficial Inches at the Bottom or Base thereof; the Product whereof multiply by one third of the Inches in the Length and that Product is the solid Quantity in Inches: which Inches divided by 1728, and the Quotient gives the Answer in solid Feet.

This Method may serve for Tapering Timber, or of any other Thing of the Shape represented in Figure 7, viz. that of a Sugar Loaf.

To measure the Pyramid.

Rule, Multiply the Side of the Base or Bottom into itself, and that Product by one third of the perpendicular Height, and the last Product will be the Content in solid Feet: Or one third Part of the Area at the Base, multiplied by the whole Altitude, gives the Content also.

Examples of both Ways.

Suppose there is given a square Pyramid (or Figure like a Spire Steeple) the Side of whose Base is 4 Foot and half,

half, and the perpendicular Height 18 Feet; what is the solid Content?

4,5	6,75 ⅓ of 20,25 the Area at the Base
4,5	18 the whole Height

225	5400
180	675

20,25	121,50 Answer 121,50 as before.
6 ⅓ of the	
Altitude	

121,50 *Answer* 121 Feet and ,50 or ½.

When one Side of the Base is longer than the other, admit one to be 2 f. ½, and the other 1 f. ½; then multiply the Length of the Base by the Breadth, and that Product by one third of the Height, as before.

To measure the Frustum or Segment, i. e. *a Piece or Part of a Pyramid or Cone.*

Rule. Suppose the whole Content to be (as above) 121,50 then the Segment being measured by itself, gives 56,25 which subtract from 121,5 and the Remainder will be the Content of the Frustum, thus:

$$\begin{array}{r} 121,5 \\ 56,25 \\ \hline 65,25 \end{array}$$

So that the Content of the Frustum is 65 f. ,25 or ¼.

Of a Circle.

Figure the ~~Seventh~~ *Ninth.*

A Circle is contained under one Line, called the Circumference or Periphery; as *ABC.* All right Lines drawn from the Centre *E* to the Circumference, are equal, and called Radius's, or half Diameters: and the long Line through the Centre from *A* to *C*, is the Diameter.

To divide a Circle in 6 equal Parts, extend the Compasses to half the Diameter, as from *A* to the Centre *E*, and the Extent will do it.

A Circle reprefents the Globe of the Earth, or Terreftial Sphere; which, if it be divided into 360 Parts, they are called Degrees; each of which, on the Face of the Earth, is accounted 60 Miles; fo that 360 multiplied by 60, produces 21600 Miles from the Circumference, according to this Verfe:

> *Geography the World's vaft Compafs ftiles,*
> *Twenty one Thoufand and Six Hundred Miles.*

Half the Semi-circle of the Circle, that is, half of the Half of the Circle, is called a Quadrant, or Quarter.

If the Diameter of a Circle be 7 Inches or 7 Foot in length; then is the Periphery or Compafs 22 Inches, or 22 Foot about.

<div align="center">Example 1.</div>

If the Compafs of a Circle be 66 Foot, what is the Diameter?

Multiply 66 by 7, and divide the Product by 22, and the Quotient gives the Diameter.

$$
\begin{array}{r}
66 \\
7 \\
\hline
22) \ 462 \ (21 \ \text{Foot, Anfwer.} \\
44 \\
\hline
22 \\
22 \\
\hline
(0)
\end{array}
$$

<div align="center">Example 2.</div>

If the Diameter be 21 Inches, what is the Circumference?

<div align="center">*The Operation is juft the Reverfe,* viz.</div>

$$
\begin{array}{r}
21 \\
22 \\
\hline
42 \\
42 \\
\hline
7) \ 462
\end{array}
$$

<div align="center">Inches 66 *Anfwer.*</div>

If a Globe be 31 Inches ¼ in Compafs, what is the Diameter?

<div align="right">*Worked*</div>

Work'd Fractionally thus:

Say 7 times 1 is 7, and 3 the Numerator makes 10, o
and carry 1; then 7 times 3 is 21; and 1 carried is 22: So
the Product is 220 the Dividend; which divide by 22,
agreeable to the Proportion before-mentioned.

Example of Operation.

$$31 \tfrac{3}{7}$$
$$7$$

22) 220 (10   Anfwer, 10 Inches Diameter.

(0)

Example 3.

Contra. If a Circle be 10 Inches Diameter, what is the
Circumference?
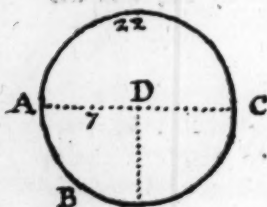
The Work.
22
10

7) 220

$31 \tfrac{3}{7}$ *Anfwer* and *Proof.*

To meafure the fuperficial Content of a Circle, either in
Inches or Feet.

Rule. Multiply half the Periphery or Compaſs, by half
of the Diameter, and the Product will be the Content.

Example.

Admit a round Table to be 14 Inches Diameter, and 44
ditto in Compaſs; what's the fuperficial Content in fquare
Inches?

22 half the Compaſs.
7 half the Diameter.

154 *Anfwer.*

Or if the Diameter be fquared or multiplied into itfelf,
and that Product multiplied by 11, and the Refult thereof
divided by 14, gives the fame Content.

Example.

14 multiplied
by 14

produces 196
multiply by 11

196
196

divide by 14)2156 (154 Quotient.

&c. as before.

Figure the Tenth.

To measure half a Circle or round Table, *viz.*

Rule. Square the Semidiameter *CD*, and that Product multiply by 22, and divide by 14; so the Answer is 77 square superficial Inches.

Inches.
7
7

49
22

98
98

14) 1078 (77 *Answer.*

To measure the Quarter or Quadrant of a Circle.

Rule. Multiply the Line *CD* into itself, and proceed as before; but multiply the first Product by the half of 22, *viz.* 11.

$3\frac{1}{2}$
$3\frac{1}{2}$

$10\frac{1}{2}$
$1\frac{3}{4}$

$12\frac{1}{4}$
By 11

14) $134\frac{3}{4}$ (9 In. $\frac{1}{2}$ $\frac{2}{14}$
126
&c.

Decimally ought to be thus,

3,5
3,5

12,25
11

1225
1225

14) 13475 (9,62$\frac{1}{2}$
126

87
85

35
28

7

The

The Decimal Work produces $\left\{\begin{array}{cc} 9, & 62 \\ \hline & 100 \end{array}\right\}$ equal to half the same Anfwer as the other $\left.\right\}$ Inch, and $\frac{7}{14}$ *viz.* Inch,

' By thefe Methods may a Piece of Timber that is half round, or a quarter round, at the Bafe or End, be meafur'd that is, by multiplying the fquare Inches at the End by the Inches of the Length.

Of Timber Meafure.

WHEN at any time you would know the Content of any Piece of Timber by Vulgar or Decimal Arithmetick, obferve what follows, *viz.* The Tree being girted and one fourth Part taken for the Side of the Square; multiply the Length of the Side of the Square in Inches into felf, and that Product by the Length in Feet; which laft Product divide by 144: But if you multiply by the Length in Inches, then your Divifor muft be 1728) and if any thing remains, divide fuch Remainder by 12, and the Quotient will be the odd Inches.

Example.

Suppofe a Piece of Timber 15 Foot long, and a Quarter of the Girt 42 Inches; what is the Content of that Piece? The Work.

```
        42  Inches the fide of the Square.
        42
       ————
        84
       168
       ————
      1764
        15  Foot in Length,
   ————————————
              F. I.
144) 26460 (183,9 Anfwer.
        144
       ————
       1206
       1152
       ————
        540
        432
       ————
    12) 108 (9 Inches.
        108
       ————
        108
       ————
        (o)
```

Note, In this Example 1764 is multiplied by 15 in one Line.

But the foregoing Example may be worked fhorter by Decimals, thus:

Squared $\begin{cases} 3,5 \\ 3,5 \end{cases}$ the Side of the Square 42 Inches.

175
105

12,25 the Product are Feet.
15 Feet the Length.

6125
1225

183,75 the Cont. *viz.* 183, $\frac{75}{100}$ or $\frac{3}{4}$ as before.

Admit a Piece of Timber or Stone by 9 Inches thick, 15 Inches broad, and 12 Foot long; what is the Content in folid Feet? See Figure the 11th.

15 broad.
9 thick.

135
12 length.

144) 1620 (11 Foot 3 Inches.
144

180
144

12) 36 (3
(o)

Of Board-Meafure.

WHENEVER the Breadth is given in Inches, and the Length of the Board in Feet, then only multiply one by the other, and divide the Product by 12, and the Quotient will be the Anfwer in fquare Feet: But if the Breadth and Length be given both in Inches, then multiply one by the other, and divide by 144, and the Quotient will be the Anfwer in fquare Feet.

Ex.

Example 1.

Suppose a Board (or any other thing of flat Measure) b
15 Inches broad, and 16 Foot long: what is the Content i
Square Feet?

	192 Length in Inches.		15 Breadth in Inches.
	15 Breadth in Inches.		16 Length in Feet.

144) 2880 (20 Feet.   90
     288   15

     (0)   12)240
                           20 Answer 20 Feet.

Here the Example is wrought both ways, as abovesaid
and the Answers are both alike.

Example 2.

Suppose a Board be 8 Inches and $\frac{1}{4}$ in Breadth, and
Foot long; what is the Content in square Feet? The Wor
follows.

$8\frac{1}{4}$ Breadth.
4 and by 4

                    In this Example, I mu
33   tiply by 4 and 4, the com
4   ponent Parts or Ratio's
                    16 the Length.
12)132

Answer 11 Foot.

Example 3.

Again, Admit a Board 17 Inches $\frac{3}{4}$ broad, and 28 Foo
long, what is the Content?

$17\frac{3}{4}$
6 and 4

                    This Example is multiplied by
$124\frac{1}{4}$ and 4, the Ratio's of 28 the Length
4

12) 497

Answer 41 Foot $\frac{1}{12}$

Once more by the other way. Suppofe a Board be 32 Inches broad, and 37 Foot or 444 Inches in Length ; what is the Content ?   4 and 8 Breadth.

$$
\begin{array}{r}
1776 \\
8 \\
\hline
\end{array}
$$

$$144)\; 14208\; (98\ \text{Foot and}$$
$$1296\,\cdot$$

$$
\begin{array}{r}
1248 \\
1152 \\
\hline
(96)
\end{array}
$$

The Parts of a fuperficial Foot, or 144 *fquare Inches.*

Inches.

  72 half a Foot.
 108 three quarters.
 126 three quarters and half a quarter.
  36 a quarter of a Foot.
  18 half a quarter.

In the laft Work, I multiply 444, the Inches of the Length, by 4 and 8, the component Parts of 32, the Inches of the Breadth ; and then divide the laft Product by 144, and the Anfwer is 98 Foot, and 96 fquare Inches remain, which is two thirds of a Foot.

Mr. *Darling*, in his Treatife of the *Carpenter's Rule*, hath, with great Pains, (and no doubt with as great Care) given a great many Tables for the Anfwer of fundry Dimenfions in Board and Timber Meafure ; but he meafures beft, that doth it experimentally by Arithmetick, by thofe fhort and eafy Rules before and hereafter mentioned, and takes not things upon truft ; for tho' Tables may be right, fo perhaps they may be alfo wrong, (for Error is endlefs ;) and then to be wholly guided by fuch Tables, it would be of fad and very pernicious Confequence ; and if the Artift is ignorant of Arithmetick, he will be bewildered and plunged into inextricable Difficulties.——I muft confefs, that Tables are of confiderable Help in cafe of Expedition ; but then you muft be very well acquainted with them ; otherwife I can in much lefs time caft up the Dimenfions, than you fhall be in finding out your feveral Numbers, and adding or fubtracting

them,

them, &c. No Man that is wife, ought to depend upon any Table for his Government, till he hath proved the Truth of every Line; and he that is able to do that, is capable of making any Table for his own Ufe; which if he takes care that it be correct, he is well provided, and need not be led into Error or Confufion by falfe Tables.

Timber, or Solid Meafure.

DIMENSIONS here are confidered in Breadth, Thicknefs and Length; the Breadth and Thicknefs are commonly called the Square; which multiplied one in the other, and that Product multiplied by the Length in Inches, and divided by 1728, the Quotient of that Divifion is the Anfwer in folid Feet.

Example.

Suppofe a **Piece** of Timber be 15 Inches fquare; that is, 15 Inches broad, and 15 Inches thick, and 16 Foot. or 192 Inches long; what is the Content of that Piece of Timber or Stone (or any other thing that is to be meafured by Cube or Solid Meafure) in folid Feet?

15 Broad.
15 Thicknefs.
———
75
15
———
225
192
———
450
2025
225
———
43200 folid In.
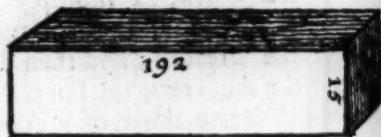
1728) 43200 (25 Foot.
3456
———
8640
8640
———
(0)

So the Anfwer is 25 Foot of folid Timber in fuch a Piece or in fuch a Stone of fuch Dimenfions, ———

Or if you multiply the Content of the Square by the Length in Feet, and divide that Product by 144, the Quotient will give the fame Content or Anfwer as before. See the following Work.

15
15
———
225 the Square.
16 the Length.
———

144) 3600 (25 solid Feet the Content.

A second Example in this, may be after the second Example in Board Measure. That is, suppose a Piece to be 8 Inches one Quarter Square, and the Length 192 Inches; what is the Content?

1728) 13068 (7 *Answer.*
12096
———

972
7 Foot and half, and 108 Cubic Inches.
Decimally.

8,25   68,0625 square Inches.
8,25   192 Length in Inches.
———   ———
4125   1361250
1650   6125625
6600   680625
———   ———
68,0625   13068,0000

Another Example. Suppose a Piece of Timber to be 17 Inches three quarters Square, and 28 Foot long, what is the Content?

17 Inches three quarters multiplied into its self Decimally the Product will be 3150625: which multiplied by the Length 336, the Product will be 105861, cutting off the four Cyphers, and the Answer will be 61 Foot, and 453 remains, being one fourth of a Foot and 21 Inches, as may be gathered by the Parts following.

The Parts of a solid Foot, being 1728 Inches.

Half a Foot ———————————— 864 Inches.
A Quarter of a Foot ———————— 432 Inches.
Three Quarters of a Foot ———— 1296 Inches.
Half a Quarter of a Foot ———— 216 Inches.

How to know in superficial or flat Measure, having the Breadth, what Quantity in Length of that Board or Piece of Glass will make a Foot square.

M 2   *Rule*

Rule. Only make the Breadth in Inches Divifor to 144, the fquare Inches in a fuperficial Foot, and the Quotient will be the Length in Inches that will make a Foot.

Example.

If a Board be 8 Inches broad, what Length of that Board (or Piece of Glafs) will make a Foot?

8 (144

Anfwer, 18 Inches, or 1 Foot and half.

Again. If a Board be 16 Inches broad, what Length of it will make a Foot?

16) 144 (9 Inches, *Anfwer,* 9 Inches.

This Method is manifeftly true, from this Obfervation; that a Board a Foot or 12 Inches broad, will require a Foot or 12 Inches in Length to make it exactly fquare, or 144 Inches: And this is known without Operation. By this Method may a Table of Board or Glafs Meafure be proved.

Likewife in folid Meafure to know what Length of the Piece of Timber will make a Foot folid, you muft make the Inches fquared Divifor to 1728, (the fquare Inches in a Foot folid ;) and the Quotient will be the Anfwer in Inches of Length, that will make a Foot folid.

Example.

If a Piece of Timber be 8 Inches fquare, what Length of it will make a Foot?

64) 1728 (27   *Anfwer,* 27 Inches, or
128   2 Foot 3 Inches in
———   Length.
448
448
———
(o)

Here the Square of 8 is 64, &c.

Again. Suppofe a Piece be 18 Inches fquare, what Length will make a Foot? *Anfwer,* 5 Inches and one third.

The Square of 18 is 324) 1728 (5 $\frac{108}{324}$ equal to $\frac{1}{3}$.
1620
———
(108)

Once more. Admit a Piece of Timber be 2 Foot 2 Inches square, *i. e.* 26 Inches square, which is &c.

674) 1728 (2 Inches $\frac{376}{674}$ or $\frac{1}{2}$ *Anſwer.*

1352

――――

(376)

So if a Piece be 10 Inches ſquare, the Anſwer will be, that 17 Inches and $\frac{28}{100}$ of an Inch is required for the Length And thus may a Table of ſquare Timber be proved.

Sawyers Work.

IN this Place it may not be improper to ſay ſomething in relation to the Method uſed by *Sawye s* in meaſuring their Work. When they work by the Great (as they ſay) moſt commonly they meaſure their Work by the ſuperficial Foot; ſo there is no great Difficulty in taking the Dimenſions; for they account the Depth of the Kerf for the Breadth, and the Length for the Length. The Dimenſions being thus taken in Feet, the Content of one Kerf ſuperficial may be found by multiplying the Length by the Breadth; and then having found the Number of Feet in one Kerf, multiply it by the Number of Kerfs of the ſame Dimenſions, and you will have the Number of Feet in them all.

Note, 1ſt, When thus they have caſt up the whole Content of their Work in Feet, they are paid for it by the Hundred, that is, 100 Feet.

2dly, That if the Kerf be but ſix Inches or leſs in Depth, then they have a Cuſtom to be paid for Kerf and half, (as they expreſs it) *i. e.* for half ſo much more as it comes to by Meaſure; and the Reaſon they give for it is, that the Trouble is ſo much the more on Account of often *ſhifting* or removing and new binding their Timber, and therefore they inſiſt on it as a cuſtomary Price.

3dly, For breaking Work, (that is, for cutting a Piece of Timber or Tree through the Middle) and Slabbing it, (*i. e.* cutting off the Outſide Pieces) if the Kerf be more than 12 or 13 Inches deep, they are paid by the Foot Lineal or Running Meaſure, at different Prices, according to the various Depths of the Kerf; and are as follows;

M 3   *Inches*

Inches deep.	d.	qrs.	
15	1		⎫
18	1	2	
20	2		
22	2	2	
24	3		
26	3	2	⎬ *per* FOOT.
28	4		
30	4	2	
32	5		
34	5	2	
36	6		⎭

4thly, In some Places it is customary to allow the Sawyer but one breaking Kerf in a Tree, tho' there be never so many Kerfs deep in it.——But some Sawyers claim to have half breaking Work, and half Hundred Work; that is, if they have four Kerfs deep, then they will have two Breaking Work, and the other two Hundred Work.

5thly, In Sawing Bevil Work, as Hipps, Sleepers, &c. Posts, &c. in Bevil-Frames, Posts or Puncheons in Polygonal Turrets, &c. also Cantrails, &c. for these they work by the Hundred, but always reckon Kerf and half for such sort of Work; that is they reckon half as many more Feet of Work than there is really performed.

Thus have I gone through what I have Room for, in relation to the several Descriptions and Uses of the Instruments commonly made Use of in Mensuration, and particularly applied to the Service of that ingenious Artist the Carpenter.

The next necessary Qualification that I shall touch upon, to introduce a young Man in the Knowledge of Business, is to say something in relation to the Art

Of Gauging.

THERE is a near Sort of Kindred or Affinity between the Art of Measuring of Timber, and that of Gauging or Measuring of Liquors; for both are performed by Cube or solid Measure, and therefore not improper closely to follow one another. For as often as there are found 1728 solid or cubick Inches in a Piece of Timber, (of what Form soever,) so many solid Feet is it said to contain: So likewise in the Art of Gauging, so many Times as 282 (the solid Inches in a Beer or Ale Gallon) are found in any Vessel of such Liquor, so many Gallons is such a Vessel said to hold. And so of Wine; but in that the Divisor alters, it being 231 solid or cubick Inches.   And

And the Gallon of Dry Measure, contains 272 ¼ cubical Inches.

Note, *Every Cubical Foot in Beer or Ale Measure, contains 6 Gallons and almost a Pint.*
The same in Wine Measure, is 7 Gallons, 2 Quarts, and almost a Pint.

A Cubical Foot of Dry Measure contains 6 Gallons and somewhat above half a Gallon.

For 141 Inches make 2 Quarts of Beer or Ale ; 70 Inches ½ one Quart, and 35 Inches ¼ a Pint.

To find the Content of any Veffel that hath the Form of a Cube, that is, a Figure whofe Breadth, Depth, and Length are all equal, and is very well reprefented by the Shape of a Dye commonly play'd withal.

Rule. Multiply the Side into its felf, and then again that Product by the Side ; which laft Product, if for Beer or Ale, divide by 282, the Inches in a Beer or Ale Gallon ; and for Wine, Brandy, &c. by 231, the cubical fquare Inches contained in a Wine Gallon.

Example.

Suppofe a Cube whofe Side is 79 Inches, I demand the folid Content in Beer and Wine Gallons ?

```
      79          282) 493039 (1748 Beer or Ale Gall.
      79              282 · · ·
     ———             ————
     711             2110
     553             1974
    ————             ————
    6241             1363                 Wine Gall.
      79             1128        231) 493039 (2134
    ————             ————            462 · · ·
   56169             2359            ————
   43687             2256            ·310
  ——————             ————            ·231
  493039 Cube Inches.  (103)         ————
                                     ·793
                                      693
                                     ————
                                     1009
                                      924
                                     ————
                                      (85).
```


M   To-
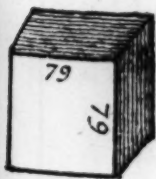
To find the Content of a Parallelepipedon, which is a folid Figure contained under fix Sides, of which the Oppofites are parallel, and of the Form of Figure the 12th.

Rule. Multiply the Length by the Breadth, and that Product by the Depth ; and then divide by 282 for Beer or Ale, and 231 for Wine.

<div align="center">Example.</div>

Admit the Length to be 95 Inches, and the Breadth 62 Inches, and the Depth 23 Inches ; what is the Content in Beer and Wine Gallons ?

```
                                    95 Length.
231) 135470 (586 Wine Gallons.      62 Breadth.
     1155
     ───                            190
     1997                           570
     ───                            ───
     &c.                            5890
rem. (104)                            23 Depth.
                                    ─────
                                    17670
                                    11780

                          282) 135470 (480 Beer Gall.
                               1128
                               &c.
                               ───
                          rem. (110)
```

<div align="center">To Gauge a Back, or fquare Tun.</div>

<div align="center">Example.</div>

Suppofe its Length 112 Inches, Breadth 72 Inches, and its Depth 48 Inches ; what is its Content in folid Inches, and alfo its Content in Beer Gallons ?

```
112 Length.       282) 387072 (1372 Gallons, Anfw.
 72 Breadth.           282···

224                    1050
784                     846
────                   ────
8064                   2047
  48 Depth.            1974
────                    ───
64512                   732
32256                   564
────                   ────
38,072 folid Inches.   (168)
```

To bring thefe Gallons into Barrels, divide them by 36, the Gallons in a Barrel of Beer, thus:

36) 1372 (38
   108

   292
   288

   (4)

Anfwer, 38 Barrels and $\frac{4}{36}$ or $\frac{1}{9}$ of a Barrel; and for the Remainder 168, it is fomething above half a Gallon,

Note, *The Duty of Excife upon Strong Beer and Ale, is 6 s. and 6 d. per Barrel: Brewers are allowed three Barrels in twenty-three for Leakage, &c. both for Strong and Small Beer; and for Ale, two in twenty-two: So that the neat Excife of a Barrel of Strong Beer to be paid by the common Brewers, is 5 s. 7 d. $\frac{3}{4}$ and $\frac{7}{23}$ of a Farthing; and of Ale, 5 s. 10 d. $\frac{1}{2}$ and $\frac{7}{11}$ of a Farthing; and for fmall Beer 1 s. 3 d. $\frac{1}{2}$ and $\frac{2}{3}$ of a Farthing.*

How to gauge a Copper, round Tub or Furnace.

If it be of equal Bignefs both at Top and Bottom, find the Cube Inches that it contains, and then bring it into Gallons, as before.

But if it be wider at the Top than at the Bottom, or the contrary; then take the Width or Diameter of the Tub fomewhat above the Middle, next to the broadeft End, if it be Taper; or find the mean Diameter thus: Suppofe the Bung Diameter to be 26 Inches, and the Head Diameter of the Cafk or Tun to be 23 Inches, the Difference between which is 3 Inches, two thirds of which makes two Inches; which added to the leffer of the two Diameters, makes 25, or the mean Diameter fought: Having the mean Diameter, proceed to find the Content in folid Inches, thus: Firft fquare the mean Diameter, which Product multiply by 11 always, and divide ever by 14, and the Quotient will give the Content of the Liquor at one Inch deep, if there be any in the Cafk, Tub, Tun, or Furnace.

Example.

Suppofe the mean Diameter to be 72 Inches, and the Length 56 Inches.

$$72$$
$$72$$

$$144$$
$$504$$

5184 the Square of the mean Diameter.
11

14) 57024 (4073
   56 · ·   56 the Length.

  102,   24438
   98   20365

  44 228088 folid Inches.
  42

(2)

The aforesaid solid Inches brought into Gallons, make 808, and 232 solid Inches remain, something above three quarters of a Gallon; in all 22 Barrels, 16 Gallons, and ¾ of Beer.

Again, Admit the mean Diameter of a Spheroid or Wine Pipe to be 14 Inches, and the Length 72 Inches, what's the Content in Wine Gallons?

$$14$$
$$14$$

196 the Square of the mean Diameter 14.
Multiply by 11

Div. by 14) 2156 (154
         72 the Length.

   308
  1078

231) 11088 (48 Gallons *Answer.*
  924

  1848
  1848
  (0)

Or the Content of a Spheriod may be found thus: Multiply the Square of the shortest Diameter by the longest Diameter, and then divide by 583 for Beer Gallons, and by 441 for Wine Gallons?

Example.

Suppose a Spheriod whose shortest Diameter is 74 Inches, and the longest 125 Inches; what is the Content in Beer 44 Wine Gallons?

$$\begin{array}{r} 74 \\ 74 \\ \hline 296 \\ 518 \\ \hline 5476 \end{array}$$ the Square of the shortest Diameter.
125 the longest Diameter.

$$\begin{array}{r} 27380 \\ 65712 \end{array}$$

538) 684500 (1272 Gallons of Beer.
538

1465, &c.

(164)

441) 684500 (1552 Gallons of Wine.
441

2435, &c.

(68)

To find the Content of the Frustum of a Spheroid; First take the Diameter at the Bung Circle, and find its Content in superficial Inches by multiplying it into its self, then multiply that Product by 11, which Product divide by 14, and the Quotient gives the Content; and then take two Thirds of that Number or Content. This do for the Diameter of the Head of the Cask; then add these two Thirds together, and multiply that Total by the Length of the Cask in Inches, and the Product will give the Content of the Vessel in Cubick Inches; which may be reduced into Gallons as before. — Or thus; to twice the Square of the Bung

Bung Diameter, add once the Square of the Head, and multiply that Sum by the Length: And for Beer divide by 1077; and for Wine Gallons, divide by 882.

<div align="center">Example.</div>

A Cask whose Bung Diameter is 23 Inches, Head Diameter 21 Inches, and Length 27 Inches; what is the Content in Beer and Wine Gallons?

```
            23                                      21
            23                                      21
          ----                                    ----
            69                                      21
            46                                      42
                                                  ----
        ┌  529  ┐ twice the Bung Diameter.         441
   add  ┤  529  ├ once the Head Diameter.
        └  441  ┘
          -----
          1499
            27  the Length.
          -----
         10493
          2998
        --------
1077) 40473 (37 Beer Gallons.
      3231·
     -------         882) 40473 (45 Wine Gallons.
      8163                 3528·
      7539·               ------
     -------               5193 almost 46 Gallons.
      (624)                4410
         °
```

<div align="center">(783)</div>

To find the Quantity of Liquor remaining in a spheroidical Cask standing on its Head.

From the Area of the Bung Diameter, subtract the Area of the Head Diameter, and multiply the Remainder by the Square of the Difference between the Wet Inches and the Semi-length, and this Product divide by the triple Square of the half Length, and subtract the Quotient from the Area of the Bung Diameter; then multiply the Remainder by the Difference between the Wet Inches and the Semi-length, and the Product will be how much Liquor is contained in the Vessel above, or under its half Content.

<div align="right">Ex-</div>

Example.

$$\text{Suppose}\begin{cases}\text{the Bung} \longrightarrow 40,8 \\ \text{the Heads} \longrightarrow 35,3 \\ \text{the Length} \longrightarrow 61,8 \\ \text{the Wet Inches} \longrightarrow 41,9\end{cases}\text{what is the Content in Beer Gallons?}$$

 61,8 the Length.   11
 30,9 the half Length.   11

 41,9 the Wet Inches.   are 121
 30,9 the half Length.

 11,0 the Difference.
 Area of the Bung Diameter 4,6362
 Ditto of the Head Diameter 3,4705 fub.

          1,1657
The Square of the Difference   121

          11657
          23314
          11657

The triple Sq. of the ½ Length 2865) 141,0497 (492
            11460

30,9   4,6362   Area of the Bung.   26449
30,9   fub. 492   the Quotient.   25785

2781   45870   6647
9270   11   5730

954,81   50,4570   (917)
 3

2864,43
131,25 the half Content of the Vessel.
 50,45 the Liquor qt. above the half Content.
118,70 the Quantity of Liquor qt. in the Vessel.

To gauge any Thing that hath the Shape of a wooden Hand-Bowl, as the Bottom of a round Copper, &c.

Admit the Bowl to be full of Water; the first Thing is to measure the Surface of the Water; that is done by multiplying half the Circumference by half the Diameter, and

                that

that gives the Content in ſuperſicial ſquare Inches. Then
find the Depth of the Water in different Places, then add
thoſe different Depths together, and divide the Total by the
Number of Depths that you take, and the Quotient gives
the mean Depth : When you have found the mean Depth,
multiply it by the Number of Inches that you found on the
Surface of the Water, and the Product gives the ſolid ſquare
Inches ; which reduce to Gallons as taught before.

<div align="center">*Example.*</div>

Suppoſe the Circumference be 120 Inches, the half of
which is 60 Inches, and the Diameter admit to be 60 In-
ches, the half of which is 30 Inches ; and ſuppoſe the ſeve-
ral Depths to be 7, 8, 9 and 10, which put together make
34 Inches; which divide by 4, the Number of Depths,
quotes the mean Depth, *viz.* 8 ½.

```
          60
          30
        ─────
        1800
          8½
        ─────
      14400
        900
      ───────
231)  15300 (66 Anſwer, 66 Wine Gallons, 3 Gallons
      1386 ·                    above a Hhd.
      ───────
      1440   282) 15300 (and 54 Beer Gallons or a
      1386        1410 ·              Hhd.
      ───────     ───────
       (4)         1200
                   1128
                   ─────
                   (72)
```

Having the Circumference of a Circle, to find the Dia-
meter; *& contra*, having the Diameter of a Circle, to know
its Circumference.

The Proportion is as 7 to 22.

So that if the Length of the Diameter be 7 Inches, then
the Circumference is 22 Inches.

<div align="center">*Example.*</div>

If the Circumference of a Circle be 132 Inches, what
is the Diameter ? Multiply by 7, and divide by 22, *&c.*

<div align="right">132</div>

$$132$$
$$7$$

22) 924 (42   *Anſwer,* the Diameter is
     88 ·   42 Inches in Length.

        44
        44

       (o)

Again, If the Diameter be 42 Inches, what is the Cir-
cumference ?

            42
            22

            84
            84

7) 924

Proof 132 Inches *Anſwer.*

Once more.   If the Circumference of a Circle be 50
Inches $\frac{2}{7}$ what the Diameter ?

            50
            7

22) 352 (16 Inches.

            22·

            132

           (o)

If the Diameter be 16 Inches, what the Circumference ?
            22

            32
            32

7) 352

50 In $\frac{2}{7}$ *Anſwer.*

The Extraction of the Square and Cube Roots, of great
Use *in Measuring, Gauging,* &c.

The Square-Root.

1st. A Square Number is any Digit, or any other Num-
ber, which being multiplied into itself; produceth
a Square Number; as 4 multiplied by 4, produceth 16;
so 16 is the square Number, and 4 is said to be the Root of
16, because it grows from, or is produced of 4; so 4 is the
Square of 2, for twice 2 is 4, and 9 is the Root of 81, for
9 times 9 is 81, &c.

2dly, To Extract the Square Root of any Number is to
find another Number which multiplied by (or into) its self,
produces the Number given, and is a Proof of the Work.

3dly, Square Numbers are either single or Compound.

4thly, All single Square Numbers, with their respective
Roots, are contained in the following Table, *viz.*

Roots	1	2	3	4	5	6	7	8	9
Squares.	1	4	9	16	25	36	49	64	81

5thly, When the Root of any square Number is required
less than 100, and yet not exactly a single Square expressed
in the Table above; then you are to take the Root of the
square Number expressed in the Table, which (being less)
comes the nearest to the given Number to be squared: As
suppose 60, the nearest Root to it (as being less) is 7, and
12 being given, the Root belonging to it is 3.

6thly, A Compound square Number is that which is pro-
duced of a Number consisting of more Places than one
multiplied by itself, and never less than 230: so 729 is a
Compound square Number, produced by the multiplying
17 into its self.

7thly, The Root of any Number under 100 may be ea-
sily known by the foregoing Table of single Squares: But
to extract the Root of a Compound Number of several
Places, observe the following Directions, in relation to the
finding the Root of this square Number 45796.

1. Set a Point over the Place of Units thus, 45796 and fucceffively over every fecond Figure towards the Left-[hand], as thus, 45796; and again thus, 45796. Thus [if] your Number be prepared for Extraction in Natural [N]umbers: But in the Decimals, you muſt point from the [Pl]ace of Primes towards the Right-hand, omitting one [Pl]ace, as above; and if the Decimals are odd, affix a Cy[ph]er towards the Right-hand of them to make them even.) [yo]ur Number thus prepared, draw a crooked Line on the [ri]ght of the Number, as in Divifion: And indeed the Ope[ra]tion of the ſquare Root is not much unlike Divifion; on[ly] there the Divifor is fixt, and in the ſquare Root we are to [fin]d a new one for each Operation. I ſay, having made a [cr]ooked Line thus, 45796(feek the neareſt Root in the [fo]regoing Table, to the firſt Point on the Left-hand, which [he]re is 4 the Root of which is 2, which Place behind the [cr]ooked Line thus:

$$45796 \ (2$$
$$\underline{4}$$
$$0$$

[an]d fubtract it, and there remains 0: Then to the Re[ma]inder, bring down the next Point 57 thus:

$$45796 \ (2$$
$$\underline{4}$$
$$057$$

[wh]ich call the Refolvend; then double the Root of the firſt [Poi]nt, and place it on the Left-hand of the Refolvend (or [up]per enough the Dividend) thus:

$$45796 \ (2$$
$$\underline{4}$$
$$4) \ 57$$

[Th]e 4, the double of the Root 2, on the Left-hand of the [cro]oked Line, call the Divifor; then feek how often 4, the [Div]ifor, can be taken in 5, the firſt Figure of the Refolvend

57,

57, (for you are to omit the laſt Figure towards the Right hand) which here is one, which 1 place behind the Root, and alſo behind the Diviſor 4, thus :

$$45796\ (21$$
$$4$$
$$4\ 1\ )\ 57$$

Then multiply the Diviſor (now) 41, by the Figure placed in the Root, *viz.* 1, and place it under the ſolvend thus, and ſubtract it therefrom.

$$45796\ (21$$
$$4$$
$$4\ 1\ )\ 57$$
$$41$$
$$16$$

Then bring down the next Point, *viz* 96, and place on the Right of the Remainder 16, for a new Reſolvend or Dividend, thus : next
double the Quotient, or
part of the Root, *viz.*
21, and place it for a
new Diviſor to the new
Reſolvend 1696, thus :

$$45796\ (2$$
$$4$$
$$4\ 1\ )\ 57$$
$$41$$
$$42\ )\ 1696$$

Then ſeek how oft 42 in 169 ? (ſtill reſerving or omit the unit Figure of the Reſolvend or Dividend, as aforeſ and I find I can have it 4 times, which I place in the Quo tient, or Place of the Root, and then the Work appears th

$$45796\ (214$$
$$4$$
$$41\ )\ 57\ \text{Reſolvend}$$
$$41$$
$$424\ )\ 1696\ \text{Reſolvend.}$$
$$1696\ \text{Product.}$$
$$(0)$$

In the laſt Step, I place 4 in the Root, and likewiſe behind the Diviſor 42, which makes the new Diviſor 424, the Reſolvend 1696 ; which Diviſor multiplied by 4, the nes placed in the Root, produces 1696 ; equal with the vidend or Reſolvend aforeſaid, as in the Operation may ſeen. So that the ſquare Root of 45796 is 214 ; for, 4 multiplied into its ſelf, produces 45796, the Number en, whoſe ſquare Root was ſought.

More Examples.

What's the ſquare Root of 12299049 (3507 the Root ?
$$9$$

1ſt Diviſor 6) 329 Reſolvend.
$$325 \text{ Product.}$$

2d Diviſor 700) 490 Reſolvend.
$$009 \text{ Product.}$$

3d Diviſor 7007) 49049 Reſolvend.
$$49049 \text{ Product.}$$

$$(0)$$

Decimally.

160,000000 (12,649

1ſt Diviſor 22) 60
$$44$$

2d Diviſor 246) 1600
$$1476$$

3d Diviſor 2524) 12400
$$10096$$

4th Diviſor 25289) 230400
$$227601$$

$$(2799)$$

Note,

Note, *That when the Divisor cannot be had in the*
solvend, then place a Cypher in the Quotient, and also in
Right of the Divisor, and bring the Resolvend a Step low
and then bring down the next Square, &c. as in the Exam
above may be seen.

Note further, *If any Remainder happen to be after*
traction, you may proceed by annexing Pairs of Cyphers to
Left of the given Number, and so come to what Exactness
please.

Note also, *Such Numbers given for Extraction that*
Remainders, are by some called Irrationals, because their R
cannot be exactly discovered, but still there will be some
remain, though you work by whole Numbers or Fractions:
in the Example above, where the Remainder is 2799.

The Extraction of the Cube Root.

TO Extract the Cube Root of any Number, is to
another Number which, multiplied by its self,
that Product by the Number found, produces the Num
given for Extraction.

From the foregoing Table for Extraction of the Squ
Root, proceed the several Squares of the Cube Root;

Roots,	1	2	3	4	5	6	7	8
Square,	1	4	9	16	25	36	49	64
Cube,	1	8	27	64	125	216	343	512

1*st*, To prepare any Number for Extraction, make
Point over Unity, and so successively over every third
gure, missing two between each Point; but in Decim
you must point from the Place of Units to the Right-ha
&c.

Example.

Extract the Cube Root of 46656, prepared thus, as ab
directed,

46656

Here are but two Points, therefore the Root will have
two Places.

2*dly*, The Number being prepared, seek in the f
going Table the nearest Root to the first Point or Period
which you will find to be 3, which place in the Quoti
thus, 6656 (3 the Cube or Triple whereof, *viz,* 3 is

ch place under your firſt Point 46, as in the   4́665́6 (3
rgent ; the which ſubtract from 46, and   27
re reſts 19 ; this is your firſt Work, and   ——
more repeated. Then to the Remainder 19,   19
g down the next Period, *viz.* 656 (which
he laſt) and place it on the Right of the Remainder 19,
:

$$4́665́6 \ (3$$
$$27$$
$$\overline{}$$
19656 Reſolvend.

n draw a Line under the Reſolverd ; next ſquare the 3
ed in the Quotient, which makes 9, which multiplied by
makes 2700 for a Diviſor, which place accordingly thus :

$$4́665́6 \ (3$$
$$27$$
$$\overline{}$$
2700) 19646

n ſeek how often 2 in 19 ? *Anſwer*, but 6 times, becauſe
he Increaſe that will come from the Quotient ; then mul-
the Diviſor by 6, and the Product will be 16200 ;
h place orderly under the dividend thus :

$$4́665́6 \ (36$$
$$27$$
$$\overline{}$$
$$19656$$
$$\overline{}$$
16200

a proceed to find the Increaſe coming from the Quotient,
: Square your laſt Figure 6, and it makes 36 ; which
iply by 3, the other Figure of the Quotient, it gives
which multiplied by 30, makes 3240. This place
orderly under the laſt Number before ſet down, *viz.*
o, and the Work will appear thus :

$$4́665́6 \ 36$$
$$27$$
2700)   19656 Dividend.
$$16200$$
$$3240$$
$$216$$
$$\overline{}$$
$$19656$$

Then

Then Cube the Figure laſt placed in the Quotient, *viz.* and it makes 216; which place orderly likewiſe under Line 3240, as above; then add the three Lines togeth and they make 19656, (for ſo many you always have the firſt Operation.) And ſeeing the Total to be equal the Dividend above, *viz.* 19656, and no more Periods bring down, I ſee the Work finiſhed, and find the C Root of 46656 to be 36.

Some Uſes of the Square and Cube Roots.

Rule. THE Root of the Product of the given Numb is the mean Proportional ſought; ſo the M Proportional between 16 and 64, will be 32 : This i good Uſe in finding the Side of a Square, equal to any rallelogram, Rhombus, Rhomboïdes, Triangle or Reg Polygon.

2. *To find the Side of a Square equal to the Area of a g Superficies.*

Rule. The ſquare Root of the Content of any given perficies is the Side of the Square. — So if the Conten a given Circle be 160, the Side of the Square equal w $12\frac{12}{49}$, or in Decimals 12,64911.

3. *The Area of a Circle given to find the Periphery.*

Rule. Say, as 113 to 1420, or 1 to 12,56637; ſo is Area to the Square of the Periphery.—So if the Area Circle be 160, the Periphery will be found to be 44,84.

4. *The Area of a Circle to find the Diameter.*

Rule. As 355 to 452, or as 1 to 1,273239, ſo is Area to the Square of the Diameter.

5. *Any two Sides of a Right Angled Triangle being g to find the third Side.*

In this uſeful Problem lies hid a great Part of the Ma maticks; it being aſſerted and proved, that the Squa the Hypothenuſe, or longeſt Side of a Right Angled Tri is equal to the Sum of the Squares of the Baſe and Per dicular, that is, the other two Sides,

Example by Figure 13.

Let the Baſe or Ground *B A* repreſent the Breadth Moat or Ditch, and the Perpendicular *B C* repreſent Height of a Caſtle, Tower, or City Wall; and the H thenuſe, or longeſt Side, repreſent the Length of a Sc Ladder.

... this Figure, the Base *A B* is supposed to contain 40 ... and the Perpendicular, or Height of the Tower or ... 30 Yards; What Length will the Hypotheneuse *A C*, ... Scaling-Ladder, be?

Rule. The Square Root of the Sum of the Squares of the ... and Perpendicular, is the Length of the Hypothenuse, ... Work.

1600 the Square of the Base 40.
900 the Square of the Perpendicular 30.

The Sum 2500 (50 Yards the Root or Length of the Scaling-Ladder.

25
——————
(o)

... if the Length of the Base, or Breadth of the Ditch, ... required; then the Square Root of the Difference of the ... of the Hypothenuse and Perpendicular is the Length ... Base, or Breadth of the Ditch or Moat. Example ... Work.

2500 the Square of the Hypothen. *A C.*
900 the Square of the Perpend. *B C.*

Differ. 1600 (40 Yards the Root or Breadth of the Ditch.

16
——————
(o)

... if the Height of the Tower or Perpendicular *B C,* ... required; then the Square Root of the Difference of ... Distance of the Square of the Hypothenuse and Base, is ... Height of the Perpendicular *B C,* representing a Tower, ... Steeple, or any thing else.

... gain, Any Number of Men given to be formed into a ... Battalia, to find the Number of Rank and File. *Rule.* The Square Root of the Number of Men given, will ... Number of Men to be placed in Rank and File. ... *Example.* Admit an Army of 32400 Men were to be form- ... into a square Battalia; the square Root of 32400 will be ... 180; and so many Men must be placed in Rank, and ... in File.

... Uses of the Cube Root are to find out a Proportion ... like Solids, as Globes, Cylinders, Cubes, &c.

Ex-

Example.

Suppose a Bullet of 8 Inches Diameter weigh 72 Pounds what will a Bullet weigh whose Diameter is 4 Inches?

Rule. Since like Solids are in Triple Proportion to the Sides, Diameters, Lines, &c. it holds, As the Cube of the Diameter given is to the Weight thereof, so is the Cube of the Diameter sought, to the Weight thereof: as *per* Work

$$
\begin{array}{ccc}
CD. & lb. & CD. \\
\text{If } 512\text{———} & 72\text{———} & 64 \\
 & 64 & \\
\hline
 & 288 & \\
 & 432 & \\
\hline
512\,)\,4608\,&(9 \text{ Pounds.} & \\
4608 & & \\
\hline
\end{array}
$$

(0)

Example 2.

If a Ship of 100 Tuns be 44 Foot long at the Keel, what Length must the Keel be of a Ship that carries 280 Tuns?

Say, as 120 is to the Cube of 44, that is, 85184; so is 280 to 1874048; whose Cube Root is 57,225 the Length of the Keel sought.

Example 3.

There is a Cubical Vessel whose Side is 12 Inches, and it is required to find the Side of a Vessel that holds three times as much. Here the Cube of 12 is 1728 which multiplied by ——— ——— ——— ———

produces ————————— ———— ———— 5 and the Cube Root of which is 17,306 the *Answer* required, or Side sought.

An easy Rule to find the Length of the Masts of a Ship.

Two thirds of the Length of the Keel, and the Breadth of the Beam, is the Length of the Main-mast; and the Rule is therefore, to multiply the Length of the Keel by 2, and to divide the Product by 5, and then to the Quotient add the Breadth of the Beam, and the Total is the Length of the Main-Mast.

Example.

Suppose a Ship to be 108 Foot by the Keel, and 40 Foot by the Beam, what is the Length of her Main-Mast ?

$$108$$
$$2$$

$$3)216$$

Add $\left\{\begin{array}{l}72 \text{ two thirds of the Keel.}\\40 \text{ the Breadth of the Beam,}\end{array}\right.$

Answer   112

Answer, The Length of her Main-Mast is 112 Foot as in the Work.

Again.

Admit a Ship to be 84 Foot by the Keel, and 31 Foot by the Beam, what is the Length of her Main-Mast ?

$$84 \text{ per Keel.}$$
$$2$$

$$3) 168$$

Add $\left\{\begin{array}{l}56 \text{ two thirds of the Keel.}\\31 \text{ the Breadth of the Beam.}\end{array}\right.$

Answer,   87 Foot, the Length of the Main-Mast.

If you divide first by 3 and then multiply the Quotient by 2, it gives the two thirds of any thing, as well as the other way.

Another *Way to find the Length and Thickness of Masts and Yards,* viz.

The Way to find the Length of the Main-Mast, is to add the Breadth of the Beam, and the Depth of the Hold together, and divide the Total by 1,5 and the Quotient will be the Length of the Main-Mast in Yards.

Example.

Admit a Ship whose Keel in Length is 75 Foot, and the Breadth of the Beam 28,5 Foot, and the Depth of the Hold Foot; what is the Length of the Main-Mast.

N   *Foot*

Foot.

21,5 Breadth of the Beam.

12,0 Depth of the Hole.

1,5) 40,5 (27 Yards *Anſwer.*

   30

  105

  105

   (o)

Anſwer, 27 Yards, or 81 Foot, as *per* Work.

Or if, inſtead of Dividing, you multiply by this Mul-
tiplier, *viz.* ,6666 and point off the Decimals, you wi
have the ſame Anſwer.

Example.

   40,5

   ,6666

 33330

266640

26,99730

Here the Anſwer is 2
Yards and $\frac{99}{198}$ of a Yar
not wanting one Secon
to make it 27 Yards,
before.

I here multiply the under by the upper Number to ſa
both Figures and Room.

To find the Thickneſs of the Maſt, having the Leng
ſay, by the Rule of Proportion (or Rule of Three) If
Foot long require 28 Inches thick, what 81 Foot long?
in the following Work.

F. I.   In. thick   F. I.

If 84 ——— 28 ——— 81

            28

     648

     162

---

84)2268(27 Inches thick Anſwer.

   168

   588

   588

   (o)

By *Trigonometry*, or the Doctrine of Triangles, are a Multitude of Questions solv'd, relating to Sailing on the Seas; to give one Instance. Suppose two Ships set sail at one time, from one Place, the one sailing directly East 48 Leagues, as from C to B; and the other directly North, as from C to A, 36 Leagues; the Question is, how many Leagues are they distant or asunder one from the other?

48 multiplied by 48, produces——————————2304
36 multiplied by 36, gives——————————1296

which two Numbers added, gives for Total 3600 (60
the square Root of which is 60; and so many
Leagues are the two Ships asunder or distant one 36
from the other.

Here the Distance of each Ship's sailing is squared, and their Squares added together, and the Total is 3600; the square Root of which is 60, and the Answer to the Question, in the Work.

And being here speaking something relating to Sea Affairs, it may not be improper to say something concerning the Mariners Compass.

Before the Invention of this excellent and most useful Instrument, it was usual in Voyages to sail by, or keep along the Coast, or at least to have it in Sight; as is manifest and plainly evident, by the Voyages of St. *Paul, Acts* xx. and 27; which Course made their Voyages long, and very dangerous, by being so near the Shore. But now, by the help of a Needle touched by the Magnet or Load-stone, which by a wonderful and hidden Quality, inclines its Points always Northerly, the ingenious Mariner is directed in his proper Course of Sailing, through the vast Ocean, and unfathomable Depths, to his intended Port: And if the Wind is favourable, can Sail near 333 Leagues, or 1000 Miles in a Week, tho' in the darkest Weather, or darkest Night, when neither Land, Moon, nor Stars, are to be seen; which before, were the only Guide; and, if not seen, the Sailors were at great Loss, and exposed to the most eminent Danger.

Behold the Figure or Representation of the said Compass, with the Cardinal and other Winds, as followeth.

The
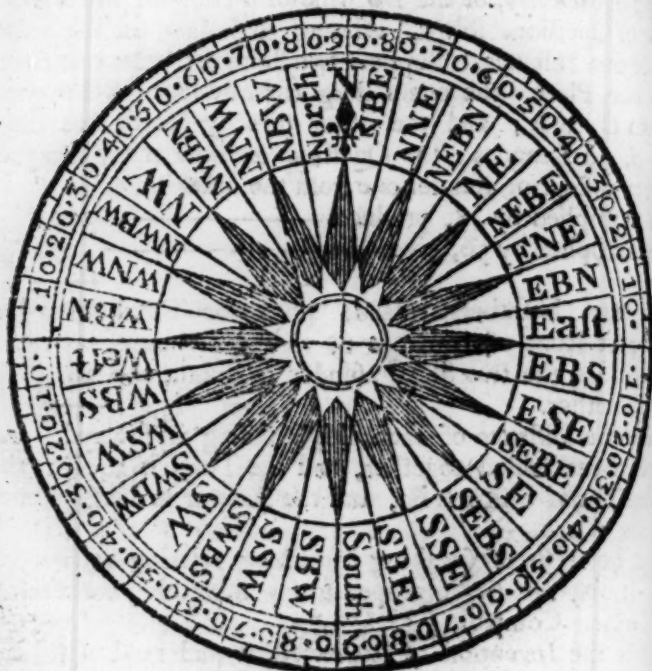
The Description.

1st, The Needle in the Centre points with its princi[pal]
End to the *Flower-de-luce,* and shews its Direction Northe[r]-
ly : And the said *Flower-de-luce* is also placed in Maps [for]
the same intended Purpose.

2dly, The Letters N by E on the Right of the sa[id]
Flower-de-luce, signifies, and is to be read, *North [by]*
East ; and the next after it *N N E,* that is, *North Nor[th]*
East ; and the next *N E by N,* to be read *North East [by]*
North ; and so round the Circumference, which Marine[rs]
usualy have by Heart, particularly the Pilot, who guid[es]
the Ship accordingly ; and sometimes he is helped by t[he]
Sight of the North Pole Star, when on this Side the Equa[t]-
or ; and by the South Pole, on the other Side.

The next Thing I shall proceed to, is to say somethin[g]
in relation to the Art of Making Dials : But it may, a[nd]
is very proper, to describe and speak of the Use of [the]
ver[y]

ry neceſſary Inſtrument called a *Quadrant*, the Shape of
which is here repreſented.
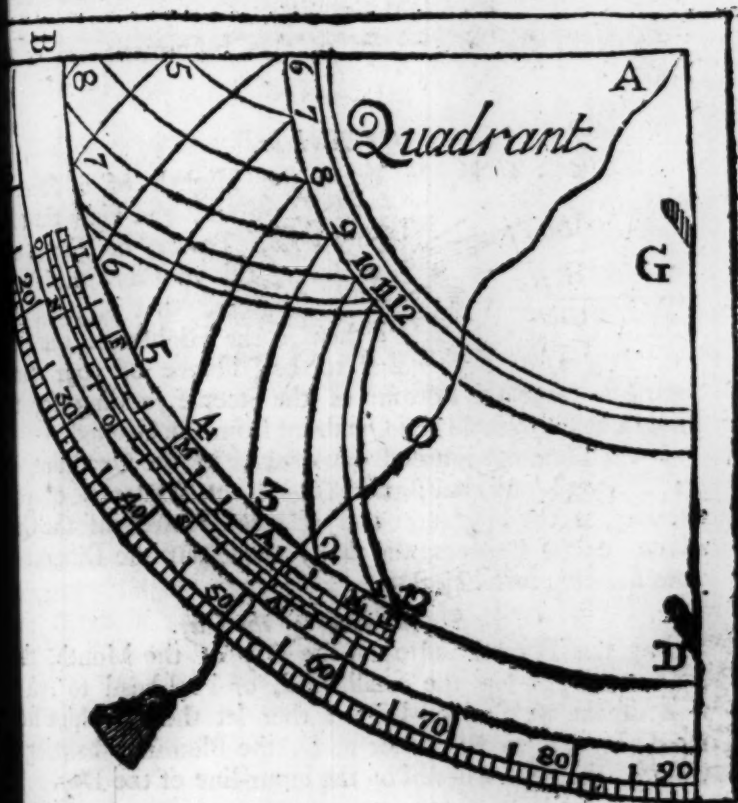
This Quadrant, or Quarter of a Circle is variouſly
ſeful, on ſundry Accounts, *viz.* to take Heights and
tances, whether acceſſible or inacceſſible ; to find the
ur of the Day, *&c.*

Its Deſcription.

The outward Arch is divided into 90 Parts or Degrees,
ng the 4th Part of the Circle of the Sphere) and figured
m 10, 20, *&c.* to 90 ; above which Figures, are Let-
ſignifying the 12 Calendar Months of the Year, as *J.*
January, F. for *February*, &c. And again, over thoſe
ters for the Months, are Lines to know the Hour of the
y : And upon the Line *G D*, are ſights of thin Braſs to
pied through, or for the Sun to ſhine through, from one

N 3

to

to the other. Laftly, in the Middle, or Point of the Qua-
drant, viz. at *A*, is a Line or Thread of Silk fixed
through a Hole with a Plummet of Lead at the End of it
and alfo a fmall Bead in the Middle.

Some of the many Ufes of this Inftrument are as fol-
lows:

Of Highths.

Suppofe you would know the Highth of a Steeple
Tower, or Tree; hold up the Quadrant, and view throug
the Sights the Top of the Steeple, Tower, or Tree, and
then ftep forwards or backwards, till you find the Plum-
met hang at Liberty juft at 45 Degrees, that is, juft in the
Middle of the Quadrant; then is the Highth of the Stee-
ple, Tower, or Tree equal to the Diftance of your Stand-
ing-place from the Bottom of the Steeple, adding for the
Highth that you hold the Quadrant from the Ground.

If the Plummet interfect one quarter of the Quadrant, or
22 Degrees and half, then twice the Diftance of your
ftanding is the Highth; and if three quarters of the Qua-
drant, or 67 Degrees and half, then half the Diftance of
your ftanding is the Highth.

To find the Hour of the Day.

Lay the Thread juft upon the Day of the Month, then
hold it till you flip the fmall Bead, or Pins-head to reft on
one of the 12 o'Clock Lines; then let the Sun fhine from
the fight at *G* to the other at *D*, the Plummet hanging at
liberty, the Bead will reft on the Hour-line of the Day.

To find the Latitude of a Place.

Hold up the Quadrant, and thro' the Sights thereof, (or
along the Edge) fpy (in a clear Star-light Night) the North
Pole Star; the Plummet hanging at liberty, the Thread will
reft on the Degrees of Latitude of the Place you be in, or
where you take your Obfervation: If at *London*, you will
find it 51 Degrees and 32 Minutes: If at *Briftol*, 51 Degrees
27 Minutes: If at *York*, 53 Degrees 58 Minutes: And if at
Berwick, 55 Degrees 54 Minutes, &c.

When it is faid that fuch a Kingdom, Country, City,
Town, or Place, lieth from 40 to 50 Degrees North Lati-
tude, it is to be underftood, that it lieth on the North Side
of the Tropick of *Cancer*, or North Boundary of the Sun,
towards us of *England*, to which the Sun comes about the

oth or 11th of *June*, and makes our Days the longeſt : And about the 10th or 11th Day of *December*, the Sun enters the Tropick of *Capricorn* its South Boundary, and is then the fartheſt from us, and makes our Days the ſhorteſt.

Of Dialing.

Dialing is a very Ancient Art, even as old as the Time of King *Hezekiah*, where mention is made of the Dial of *Ahaz*, in the 2d Book of *Kings*, Chap xx. verſe 11.

The Gnomon or Subſtile of a Poſt or Horizontal Dial, ſhould point directly South, and its Back will be then directly North. The South may be truly known by a good Watch or Clock, juſt at Noon ; for then the Sun is always at the Meridian ; and makes juſt 12 o'Clock ; ſo that knowing the South, it will not be difficult to find the North, it being its oppoſite :

To fix a Dial North and South.

Faſten your Board on the Top of a Poſt, and then with your Compaſſes make 4, or 5 or 6 Circles, one within the other, from the Center or Middle, where place a large Pin perpendicular or upright, and nicely obſerve, when the Sun ſhines in the Forenoon, on which Circle the Head of the Pin ſhadoweth ; then there make a Mark ; and do the ſame in the Afternoon, when the Shade of the Pin's-Head comes on the ſame Circle ; and from the Midway of the two Marks, draw a Line to the Centre, on which place your Meridian or 12 o'Clock Line : ſo will the Poſt-Dial point North and South.

By the Meridian-Line, you may alſo know when the Moon, or a Star of Magnitude, comes to the South ; which when they do, they are always at the Higheſt, whether by Night or Day.

Before the Figures or Repreſentations of Dials, it may not be amiſs to give the Senſe and Meaning of ſome few Terms uſed in Dialing, Geography, &c.

Horizontal, belonging to the Horizon ; which is that Circle that terminates the Sky, and a Boundary to our Sight, and divides the Upper Hemiſphere from the Lower, being the Line in which the Sun always riſes and ſets.

Equinoctial Line, or *Equator*, A Line going through the Middle of the World, and equally diſtant both from the North and South Poles, in which Line the Sun circleth

on

on the 10th of *March*, and 10th of *Sept.* and then make the Days and Nights of equal Length.

Tropicks, are two imaginary Circles on the Globe, for the Bounds of the Sun's Course; as was spoken of before.

Meridian, Another imaginary Circle passing through the Poles and the Zenith, and being touched by the Sun makes Noon-day.

Zenith, Is the Point directly over our Heads.

Nadir, It the Point opposite to the *Zenith*, and directly under our Feet.

Zodiack, Another imaginary Circle on the Globe, containing the Yearly Course of the Sun through the 12 Signs, viz. *Aries, Taurus, Gemini, Cancer, Leo, Virgo, Libra, Scorpio, Sagittarius, Capricornus, Aquarius* and *Pisces.*

A small Representation of the Globe.
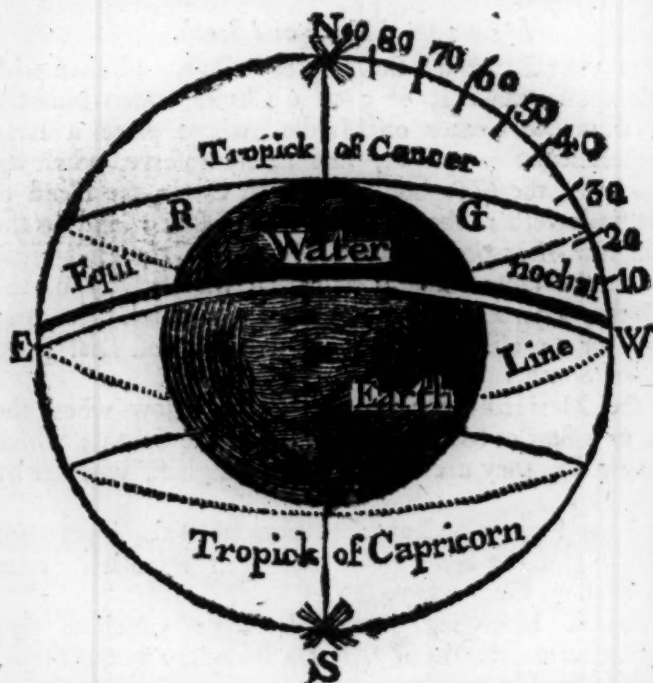
In this Figure, the middle Line is the Equinoctial or Equator; the upper, the Tropick of *Cancer*; and the under Line the Tropick of *Capricorn*, spoken of before; the Line noted N. W. is a Quarter of the World, and divided into

to Degrees from 10 to 90, and is a Quadrant, every Degree on the Surface being accounted 60 Miles; and if you multiply 90, the Quadrant or Quarter of the Globe, by 60, the Product will be 5400; which multiplied by 4, gives 21600 Miles for the Circumference of the whole Globe of the Earth and Sea.

The North and South Poles are fixed Stars, never varying from their Places; but their Elevation alters, according to your being nearer or farther from them. From one of theſe Pole-Stars to the other, there is an imaginary Line ſuppoſed to paſs through the Centre of the Globe, and called the Axis, or Axle-tree of the World; round which, and ſo about the Earth, the Sun appears to circle every 24 Hours.

But to return to Dialing, the following Figure, repreſents a Horizontal Dial.
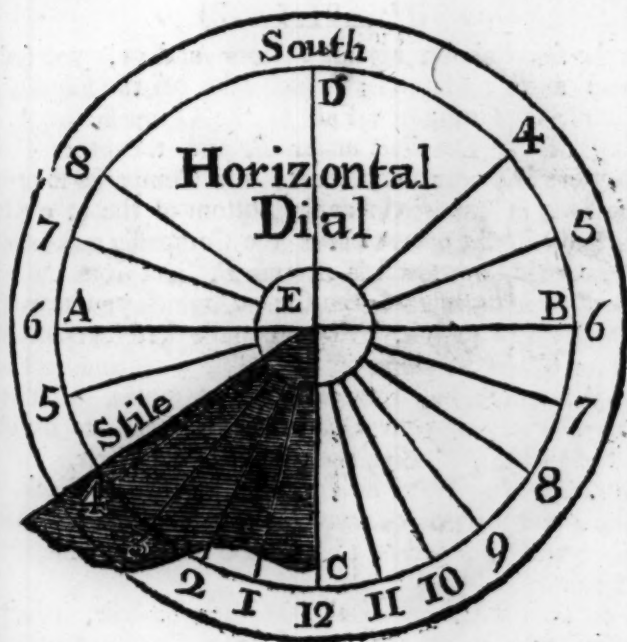
First, with a Ruler draw the Line *A B*, then croſs it in the Centre with another Line, as the Line *C D*, which is the Meridian or 12 o'Clock Line; and the firſt Line drawn, viz. *A B*, is the 6 o'Clock Line: Then open your Compaſſes,

paſſes,

paſſes and place one Foot at the Beginning of the Degrees
or the Arch Edge of your Quadrant, and extend the other
Foot to 60 Degrees, and with that Extent place one Foot
in the Centre of the Dial, at *E*, where the two firſt Lines
draw croſs one another, and draw the Semi-circle *A C B*.

Next having the 12 o' Clock Line *E C*, to know what di-
ſtance muſt be ſet off from it, for 1 o' Clock and 11 o' Clock
being all one ; be directed by the following ſmall Table, whe

52		
D.	M.	Hours
11	55	1	11
24	26	2	10
38	13	3	9
53	44	4	8
71	9	5	7

In the firſt Column againſt 1 Hour and 11, you find 11
Degrees and 55 Minutes ; which take off the Edge of the
Quadrant, by ſetting one Foot of the Compaſſes at the Be-
ginning of the Diviſions under *B*, and the other Foot at
11 Degrees and near a ſmall Part ; the Compaſſes ſo open'd
at one Foot in the Circle at the Bottom of the 12 o' Clock
Line, and with the other Foot of the Compaſſes make a Mark
in the Circle both towards *A* and *B*, and from thoſe two
Marks draw Lines towards the Centre, which you may after-
wards go over with Ink. Then to make the Hour-lines from
2 and 10 o' Clock, look in the Table for 2 and 10 Hours,
which you will find 24 Degrees and 26 Minutes, which take
off the Degrees of your Quadrant, and mark as the other
from the 12 o' Clock Line both Ways in the Circle.

Note, The ſame is to be done for 3 and 9 o' Clock, and
alſo for 4 and 8 o' Clock ; and the like for 5 and 7 o' Clock,
and for 5 and 7, 4 and 8, above the 6 o' Clock Line, ſet off
the Diſtances as below it.

Then for the Hi hth of the Gnomon or Stile, admit 52
Degrees, take it off the Edge of the Quadrant with the
Compaſſes as before, and with that Extent ſet one Foot at Bot-
tom of the 12 o' Clock Line, as before, and extend the other
Foot in the Circle, and make a Mark, and then draw a Line from
thence to *E* the Centre, for the upper Edge of the Stile, and
ſo raiſe it directly over the Meridian or 12 o' Clock Line.

Befor

Before I proceed farther, two or three Things should be shewn, as being essentially necessary to be known, because this Art hath great Dependance on them. And first,

Upon a Right Line given to erect a Perpendicular, as in Figure the 14th.

Let *C D* be the Line given to have a Perpendicular on it from *B*; with the Compasses (open'd at a small convenient Distance) place one Foot in the Point *B*, and with the other make the two Marks *E* and *F*, on either Side of *B*; then open the Compasses to a more large and convenient Distance and make the Arch *G G*, by setting one Foot in *E*, and as near as you can over the Point *B*; then (the Compasses being open at the same Distance) place one Foot on the Point *F*, and describe the Arch *H H*, crossing the former at the Point *A*; thro' which Intersection with a Ruler draw the Line from *A* to *B*, which will be Perpendicular to the Line *C D*.

How to raise a Perpendicular on the End of a Line.

This is effected several Ways; but I shall Instance only two, which are very easy.————See Figure 15.

First Method.

Suppose the Line *A B* be given to raise a Perpendicular towards the End.

First, open your Compasses to any small Distance, and set one Foot in the Point *A*; and with the other, describe the Arch *F E D*; then with one Foot of the Compasses in *D* (they being opened to the same Distance) cross the Arch in *E*; and then setting one Foot in *E*, with the other make the Arch *A F G*, crossing the first Arch in *F*. Again, set one Foot in *F*, and with the other describe the small Arch *H H*, crossing the former in the Point *C*; so the Line *A C* being drawn, is the Perpendicular required.

The Second Method.

Admit *B* be the Point given on which to draw the Perpendicular *B I*. Open the Compasses to any small Distance; and setting one Foot in the Point *B*, pitch down the other Foot at random, as suppose at *K*; then the Foot stir in *K*, turn the other about till it cross the Line *A B* at *L*; then draw the Line *K L*, and set the same Distance at *L* (at which the Compasses already stand) from *K* to *M*;

so

fo a Line drawn from *B*, thro' *M*, is the Perpendicular on the End of the Line *A B*.

How to divide a Right Line into two equal Parts, and at Right Angles: as in Figure the 16th.

Suppofe the Line *A B* be given to be divided into equal Parts, at Right Angles. Take in the Compaffes any Diftance above half the Length of *A B*, and fetting one Foot in the Point *A*, with the other draw the Arch *C D E*; then (the Compaffes unaltered) fet one Foot in *B*, and with the other crofs the former Arch both above and below the Line, in the Points *F* and *G*; then a Line drawn from *F* to *G* fhall interfect, or cut the given Line in *H*, and divide the Line *A B* into equal Parts, and at Right Angles.

Again, *A Line being given, how to draw another Line parallel thereunto, at any Diftance required, or through any Point affigned.*

Of Parallel Lines there are two Sorts, viz. *Straight* or *Circular*. All Circles drawn on the fame Centre, whether greater or leffer one than the other, are faid to be Parallel or Concentrick, that is, having one common Centre, as in Figure the 17th.

In this Figure, the Circle *A B C D* is concentrick or parallel to the Circle *E F G H*, becaufe both of them are drawn from the fame Centre. The Line *A C* is the Diameter of the greater Circle, and the Line *E G* of the leffer Circle. And all Right Lines drawn from the Centre to either of the Circumferences, are equal with Refpect to their Periphery; and fuch Lines are called half Diameters, and fometimes the Radius of the Circle, and will divide the Circle into 6 equal Parts, each containing 60 Degrees, and the whole Circle 360; into which all the great Circles of the Sphere are fuppofed to be divided.

Of Parallel Right Lines.

Right lined Parallels, are Lines drawn on a Plane of equal Length and Diftance; and tho' infinitely extended will never meet, and in all Parts retain an equal Diftance, fuch as thefe underneath,

B ——————————————— C
C ——————————————— D
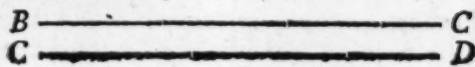
To draw a Right Line Parallel to another Right Line, at a Diſtance given : as in Figure the 18th.

Take in your Compaſſes the given Diſtance *G H*, then ſetting one Foot in *E*, draw the Arch *I K*; then moving to ſ, deſcribe the Arch *L M*; then laying a Ruler on the Top of the two Arches, juſt touching them, draw the Line *N O*, which will be parallel to the given Line *E F*.

To bring any three Points (not in a ſtraight Line) into a Circle, by finding the Centre, ſo that the Circle ſhall paſs thro' thoſe Points : as in Figure the 19th.

Let the three Points given be *A B* and *C*, through which it is required that a Circle be drawn. Firſt ſet one Foot of the Compaſſes in one of the given Points, as ſuppoſe in *A*, and extend the other Point to *B*, another of the Points, and draw the Arch of a Circle *G F D*; then (the Compaſſes not altered) ſet one Foot in *B*, and with the other croſs the ſaid Arch with two ſmall Arches, in the Points *D* and *E*, and draw the Line *D E*. Thirdly, Set the Foot in *C*, (the Compaſſes being at the ſame Diſtance) and with the other Foot croſs the firſt Arch *G F D* in the Points *F* and *G*, and draw the Line *F G*, croſſing the Line *D E* in the Point *O*, which is the Centre ſought for; in which, place one Foot of the Compaſſes, and deſcribe the Circle at the Diſtance *O A*, and it paſſes through all the given Points *A B* and *C*.

How to make a Line of Chords Geometrically to any aſſign'd Length or Radius.

Since in the Art of Dialling, there is frequent Uſe made of the Line of Chords, it is proper here to ſhew the making thereof.

A Line of Chords is 90 Degrees of the Arch of a Circle, transferred from the Limb of the Circle to a right Line ; now every Circle, whether great or ſmall, is divided (or ſuppoſed ſo to be) into 360 equal Parts, called Degrees ; So the Semi or half Circle contains 180, the Quadrant or Quarter 90, and the Radius or Semi-diameter (which is that Line on which the Circle or Semi-circle is drawn or deſcribed) noted in Figure the 20th of the *Line of Chords*, with the Letters *A B*, is always equal to 60 Degrees of that Circle which it deſcribes, and therefore 60 Degrees in a Line of Chords is called the Radius thereof.

To make the Line of Chords : as in Figure the 20th.

Firft draw a Line of any Length, as *C B D,* and on the Middle thereof draw the Perpendicular *A B* ; next open your Compaffes to the Radius or Length that you would have your Line of Chords be of; which admit *A B,* and with that Diftance on *B* as the Centre, defcribe or draw the Semi-circle *C A D,* which is divided into two equal Parts or Quadrants by the Perpendicular Line *A B* thirdly, divide the Arch or Quadrant *A R D,* into 90 equal Parts or Degrees; which is done by taking the Length of the Line *A B,* and fetting that Diftance on the Quadrant *A D,* and from *D* to *R* ; fo is *D R* 60 Degrees, and *A R* 30 Degrees ; then take the Diftance *A R,* and fet it from *D* to *S,* fo is the Quadrant divided into three equal Parts at the Point *S* and *R,* each containing 30 Degrees : This done, divide the feveral Spaces between *A R, R S* and *S D* into three equal Parts, each of which will be 10 Degrees according as the Numbers are feen, and fet apart to them. And thefe again divided into two equal Parts, each Part contains 5 Degrees ; and every of thofe into five fmaller, as in the Reprefentation ; and fo the whole Quadrant is divided into 90 Degrees. Fourthly, The Quadrant *A R S D* being thus divided into 90 Degrees, fet one Foot of the Compaffes in *D,* and open the Foot to *A,* and defcribe the Arch *A E F,* touching the Line *C D* in *F* ; fo is the Point *F,* upon the Right Line *C D,* the Chord of 90 Degrees. Fifthly, Open the Compaffes from *D* to 80 Degrees, and defcribe the Arch 80 *G H* ; fo fhall the Point *H* be the Chord of 80 Degrees. Sixthly, Open the Compaffes from *D* to 70, defcribe the Arch 70 *I K,* fo is *K* the Chord of 70 Degrees. Again, open the Compaffes from *D* to the Radius or 60 Degrees, and defcribe the Arch *R L,* fo is *B* the Chord of 60 Degrees, equal to the Radius. Do the fame by 50, 40, 30, 20, and 10, and then you will have the Line *D F* divided into 90 unequal Parts, called Chords, as in Figure 20.

Thus much for the Line of Chords, frequently made ufe of in Dialing, where there is not the Conveniency of having a Mathematical Inftrument-maker near at hand.

Note, *A Degree is the* 360*th Part of the Globe, or of any Circle ; each of which Degree is fuppofed to be divided into* 60 *Parts, called Minutes ; fo that* 45 *Minutes is three*

Quarters of a Degree, and 30 *Minutes half a Degree, and* 15 *Minutes one Quarter of a Degree, &c.*

Of Upright Planes.

THOSE Planes are faid to be Erect or Upright which ftand Perpendicular to the Horizon of the Place, whofe upper Part pointeth to the Zenith, and their lower Part to the Nadir; and fuch are the Walls of Houfes, Churches, Steeples, &c. againft which Dials are commonly made.

Of upright or erect Planes, there are two Sorts, *viz. Direct* and *Declining.*

How to draw the Hour-Lines on a Direct South Plane, in the Latitude of 51 Deg. 32 Min. as defcribed by the following Reprefentation.
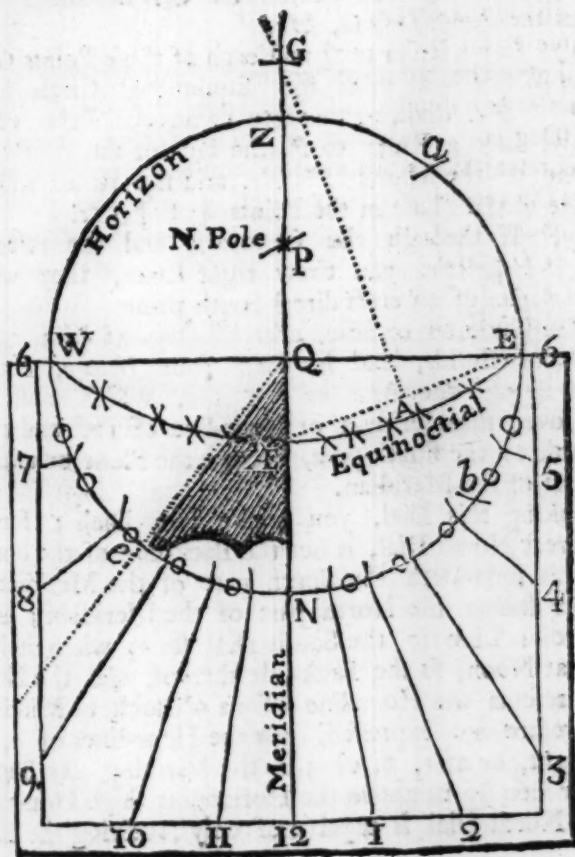
First draw the Circle *Z E W N*, reprefenting an upright direct South Plane; next crofs it with the Diameters *Z Q N*, for the Meridian or 12 o'Clock Line; and *W Q E* for the prime vertical Circle, or Hour Line of Six.

Secondly, out of your Line of Chords take 38 Degrees 28 Minutes, (the Complement of the Latitude of the Place) and fet that Diftance on the Dial-plane from *Z* to *a*, and from *E* to *b*, and from *N* to *e*.

Thirdly, Lay a Ruler from *W* to *a*, and it will cut the Meridian *Z N* in the Point *P*, the Pole of the World; and a Ruler alfo laid from *W* to *b* will cut the Meridian in *Æ*, which is the Point thro' which the Equinoctial muft pafs; for the drawing of which, you have 3 Points given, *viz.* *E Æ* and *W*, and the Centre will always be in the Meridian Line *Z N*.

Fourthly, Divide the Semi-circle *E N W* into 12 equal Parts, at the Points *O O O*, *&c.*

Fifthly, Lay a Ruler to *Q* and each of thofe Points *O O O*, and the Ruler will crofs the Equinoctial Circle in the Points * * * *&c.* dividing that into 12 unequal Parts.

Sixthly, Lay a Ruler to *P* (the Pole of the World) and every one of the Marks * * * *&c.* and the Ruler will crofs the Circle of the Plane in the Points | | | *&c.*

Laftly, If through the Center *Q* and the refpective Points | | | *&c.* you draw right Lines, they will be true Hour-lines of an erect direct South-plane.

For the Gnomon or Stile, take 38 Deg. 28 Min. out of the Line of Chords, and fet them from *N* to *e*, drawing the Line *Q e* for the Axis of the Stile, which muft hang directly over the Meridian or Hour-line of 12, and points downwards to the South-pole, becaufe the Plane beholds the South Part of the Meridian.

In making this Dial, you make two Dials; for the Erect Direct North Dial, is but the Back-fide of the South; for as this beholdeth the South part of the Meridian, fo the other faceth the North part of the Meridian; and as the Meridian Line in the South Dial fhews when it is 12 o'Clock at Noon, fo the Back-fide thereof, *viz.* the North-fide, reprefents the Hour-line of 12 o'Clock at Midnight, and therefore not expreffed, nor the Hour-lines of 9, 10, 11 at Night, or of 1, 2, or 3 in the Morning, the Sun being never feen by us above the Horizon at thofe Hours: So that the North Dial is capable of only receiving the Hour

f 4, 5, 6, 7 and 8 in the Morning, and 4, 5, 6, 7 and 8
t Night, and (in this Latitude) not all of them neither;
or it shines not in this Plane at 8 in the Morning, nor at
in the afternoon; but it is best to put them down, as in
e Figure following, to know how much it it past 7 in the
Morning, and what it wants of 5 in the Afternoon.

An Erect Direct North Dial.
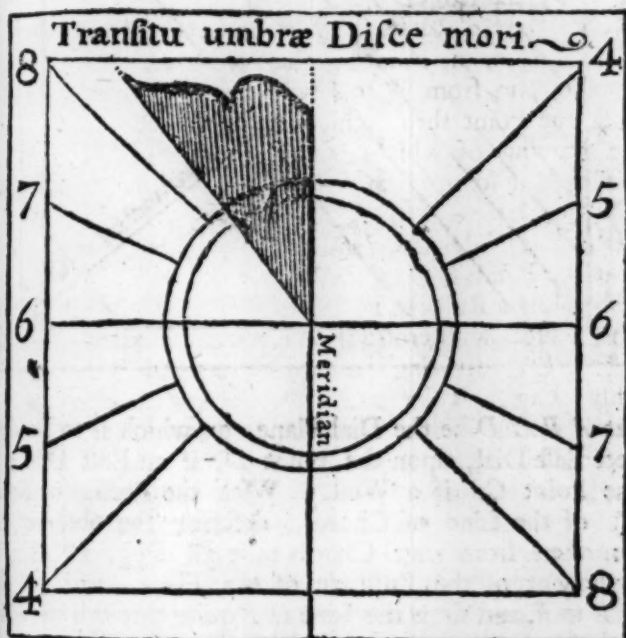
To draw the Hour-lines on an erect direct East or West
ne.————Hour-lines in these Dials must be parallel
one another, and the Dial not have any Centre, but
wn as follows,

An East direct Dial, in the Latitude of 51 *deg.* 32 *min.*

Let *A B C D* be the Dial Plane, on which is to be draw
a direct East Dial, upon the Point *D*, if an East Dial; an
on the Point *C*, if a West,   With the Radius (or 60 De
grees) of the Line of Chords, describe the obscure Arc
E F; then from your Chords take 38 Deg. 28 Min. the
Complement of the Latitude of the Place, and set them
from *E* to *F*, and draw the Line *D F* quite through the Plane
then that you may proportion the Stile to the Plane, so that
you may bring on all the Hours from Sun-rising to
o' Clock, assume two Points in the Line *F D*, one toward
the End *D* (as the Point *G*) for the Hour Line of 11, an
another at *H*, for the Hour-Line of 6 ; and thro' the Point
G and *H*, draw the Lines 11 *G* 11, and 6 *H* 6, in th
* Point L; so shall *L H* be of the Highth of the Perpendicu
lar Stile proportioned to this Plane.

For the drawing of the Hour-Lines, set one Foot of the
Compasses (opened to 60 Degrees of the Chords) in *L*, an
with the other describe the Arch *M N*, between the Hou
line of 6, and the Line *G L*; which divide into five equa
Parts in the Points ⊙ ⊙ ⊙ ⊙ ⊙ and a Ruler laid from the
Point *L*,   to each of these Points ⊙ ⊙ ⊙ &c. will cut the
Equinoctial Line *H D* in the Points *****; thro' whi
Point

* *Perpendicular to the Equinoctial, & those shall be the 11 & 6 o'Clock*
Hour-lines of your Dial.   Then, with 60 Degrees of the Line of Chords,
on the point G, describe a small Arch of a Circle, as I K, & upon it set

Points draw Lines parallel to 6 *H* 6, as the Lines 7 * 7, 8 * 8, &c. as may be seen in the Figure.

And thus you have made two Dials, *viz.* a West Dial as well as a East ; only the Arch *E F*, through which the Equinoctial passeth in the East Dial, is drawn on the Right-hand of the Plane ; but in the West it must be drawn on the Left ; and the Hour-Lines 4, 5, 6, 7, 8, 9, 10, and 11 in the Forenoon, on the East Dial, must be 8, 7, 6, 5, 4, 3, 2, and 1 in the Afternoon, upon the West-Dial, as in the Figure.

An erect and direct West Dial.
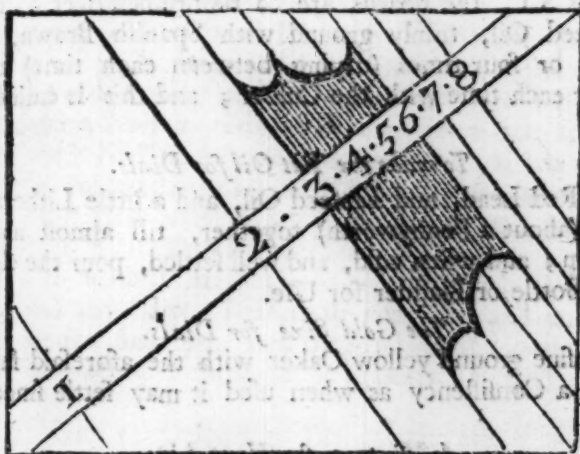
The Stile of the East or West-Dials, may be either a straight Pin of the just Length of the Line *H O* in the other Figure, which is equal to *H L* in the East Dial fixt in the Point *H*, on the Hour-Line of 6, and exactly perpendicular to the Plane, shewing the Hours by the Shadow of the Apex, or very near the Top thereof : Or, it may be a Plate of Brass of the same Breadth with the Distance of the Hour-Lines of 6 and 3 ; which Plate must be set Perpendicular upon the Hour-line of 6, and so it will shew the Hour by the Shadow of the upper Edge thereof, as in the foregoing West Dial.

An easy Way how to fix a Dial North and South.

Fix a square Piece of Board like a Trencher on the Top of a Post, and with your Compasses draw 4, 5, or 6 Circles one within another from the Centre ; in which Centre fix a large Pin perpendicularly, and when the Sun shines in the

Fore-

Degrees, (or one Hour's distance) from 1 *to* K ; & draw the Line L, cutting the 6 o'Clock Hour-line in L ; &c. as in the preceding Page, after the Caret.

Forenoon, note which Circle the Pin's Head shadeth, and there make a Mark: Do so in the Afternoon when the Shadow of the Pin's Head comes on the same Line; and from the Midway of those two Marks, draw a Line to the Centre; upon which Line lay your 12 o'Clock or Meridian line of your Post-Dial, because it directly points North and South. Thus by this plain Way, without any other Instrument, find the Situation of your Dwelling, whether full North or South, or whether it declines East or West, &c.

Of Beautifying and Colouring Dials.

FIRST, the Boards are to be brushed over with Linseed Oil, thinly ground with Spanish Brown, done over 3 or four times (drying between each time) a little thicker each time with the Colour; and this is called *Priming*.

To make the Fat Oil for Dials.

Boil Red Lead, and Linseed Oil, and a little Litherage of Gold, (about a Pennyworth) together, till almost as thick as Syrup; and when cold, and well settled, pour the clearest into a Bottle or Bladder for Use.

The Gold Size for Dials.

Mix fine ground yellow Oaker with the aforesaid fat Oil, to such a Consistency as when used it may settle smooth of its self.

A Mixture for Hour-Lines.

Grind Vermillion or Lamp-black with the fat Oil.

To draw Golden Letters or Figures for the Hours.

First draw them with a Pencil dipt in the Gold Size before mentioned; which when so dry as just to stick to your Fingers, then with a smooth-edg'd Pen-knife shape your Leaf-Gold to your Mind; take it up with a Piece of Cotton-Cloth fixt to the End of a Stick, and lay it on the Size, pressing it down with the same Cotton, and, when dry, brush off the loose Gold with a Feather, and smooth the rough Edges of the Letters with a Pencil dipped in red or black Colour.

Of the Dial Plain.

Let the Board be of the best season'd, firmest, clearest Oak, one, two or more Foot square, and about three Inches

thick.

hick. Take two Boards, and get them planed on both
sides, and then laid in the Sun-shine, or near a moderate
Fire 2 or 3 Days together; then plane them again, and fix
them with good Joints; and fasten them in gluing with
wooden Pegs, as I have seen Coopers fix the r Pieces of
Heading for their Casks; and when thus glued and dried,
plane them again, and then fasten them, by nailing too
small Plates of Iron or Tin on the Back. If you cannot get
seasoned Wood, but green, then boil it about an Hour in
Water, to make it tough, and keep it from warping. In
the general, Wood is accounted better than Stone, because
it keeps the Colouring more stanch or firm.

Before you colour your Dial-plate or Board, fix your
Iron Stile of 38 Degrees (which indifferently serves for all
England;) and having marked your Hour-lines with Ink,
and fastened a Nail at the End of each Hour-line, that the
Head of each Nail may shadow or direct you to the Centre
when it is coloured. And as it may happen that Golden
Letters or Figures may decay in a few Years, you may
on that Account make them with White-lead-paint, pointed
with Red in a Black Margin.————When your Dial is fi-
nished, and dry, dip a Feather in your Oil, and anoint it
thinly; for the finer you mix or grind the Colouring with
the Oil, the more beautifully it appears, though not so
lasting.

These Hints of Colouring Dials, puts me in mind of
some other necessary Touches, relating to sundry Mixtures
of Colours, and dying of Stuffs, &c. collected from Mr.
Salmon's Polygraphice.

Of Colours, and Dyeing.

Whites, are Ceruse, Flake-White, and White-lead.

Blacks, are Lamp-black, burnt Cherry-stones, and old
Ivory burnt.

Reds, are Red-lead, Vermillion, **Red Oaker**, and Indian
Lake.

Greens, are Verdigrease, Verditure, and Sap-green, made
of the Juice of Buckthorn-berries.

Yellows, are Saffron, yellow Pink, and Gambogia.

Brown, is Umber burnt.

Gold Colour, is Orpiment.

Again, *Verdigrease,* with a little Sap green, makes a
good and a right Green.

Blues.

Blues, are Ultramarine, Smalt, Indico, and blue Bice.

Of mixing Colours.

Colours are mixt by being ground on a Stone with fair Water feverally, and dryed, and kept in Paper Bags for use; except Lamp-black, Saffron, Smalt, Gambogia, and Sap Green.

Blue; to compound, temper a little Indigo and Smalt with Oil.

A Light Blue; mix Smalt and White-lead together.

Red Colour, mix Lamp-black, and White-lead together on a Marble.

A Fox Colour, is Umber burnt.

Gold Colour, is Orpiment mixt with fat Oil, by a Knife on an Earthen Plate, or Gally-Tile rather.

To hinder Colours from cracking, put Oil of Wallnuts to them.

Yellow Colour; beat Saffron to Powder, and fteep it in Vinegar.—Or take the Yellow Chives in White Lillies and Gum Water mixt for Writing.

Red; Vermilion with Gum Water mixt for Writing.

Golden-Letters; to write, mix Vermilion and Gum-Ammoniack with Yolks of Eggs.

Of Dying Wool, Stuffs, &c.

To die *Blue*, Take Woad 1 Pound, and mix it with 4 Pints of boiling Water, and dip Whites in it 24 Hours.

To die *Red* of a clear Colour, Take 60 Pints of Water wherein Brann has been fteeped 24 Hours, and, when ftrained, diffolve 2 Pound of Allom, and 1 Pound of Tartar; in which Water boil what you have to Dye for Hours; then take it out, and boil it in half as much Freſh Water made of Brann, *viz.* 30 Pints; to which add Madder 3 Pound, and fo perfect the Colour with moderate Warmth, without Boiling.

To die *Green*, Firft make a Yellow by the Direction underneath; then take 60 Pints of Water wherein Brann hath been foaked, aforefaid, then ftrain it, let 3 Pound of Allom be diffolved in it, and then boil what you have to die in it, for two Hours.

To die *Yellow*, Take Woad 2 Pound of the faid Water of Brann, and boil till the Colour is good.

And if you would have the said *Yellow* to be *Green,* put the Stuff into the aforesaid *Blue Lye.*

To die a *Sad Colour,* add Logwood to the *Blue Dye* before-mentioned.

To dye Linnen or Thread, *&c.* like Red : Take Powder of Brazil and Vermilion, of each 1 Ounce, boiled in Allom-water.

To dye Linnen or Thread Yellow; diffolve Gombogia in Allow-water, *&c.*

To ftain Skins Blue : Boil Eldern-Berries, and with the Liquor brufh over the Skins, and wring them ; then boil the Berries in Allom-water, and wet them twice over.

Hint *of Generals, or Things proper to be known and remembred on proper Occafions.*

Ream of Paper, 20 Quires.

Quire of Paper, 24 or 25 Sheets.

Bale of Paper, 10 Reams.

Roll of Parchment, 5 Dozen, or 60 Skins

Dicker of Hides, 10 Skins.

Ditto of Gloves, 10 Dozen Pair.

Laft of Hides, 20 Dickers.

Load of Timber unhewed, 40 Foot.

Chaldron of Coals, 36 Bufhels.

Hogfhead of Wine, 63 Gallons.

Ditto of Beer, 54 Gallons.

Barrel of Beer, 36 Gallons.

Ditto of Ale, 32 Gallons.

Grofs, 144 or 12 Dozen.

Weigh of Cheefe, 256 Pounds.

Days in a Year 365. Weeks 52, and Hours 8766.

Pence in a Pound 240, Farthings 960.

Acre of Land 160 Square Poles or Perches.

Laft of Corn or Rape-Seed, 10 Quarters.

Ditto of Pot-Afhes, Cod-Fifh, white Herrings, Meal, Pitch and Tarr, 12 Barrels.

Ditto of Flax and Feathers 17 C. of Gun-powder 24 Barrels, or 2400 lb. of Wool, 4368 lb.

Tun of Wine, 252 Gallons ; Oil of Greenland, 252 Gallons ; and fweet Oil of Genoa, 236 Gallons.

Tun in Weight, 20 C. of Iron, *&c.* but of Lead there is but 19 C. and half, called a Fodder or Fother.

And Todd of Wool, 28 Pounds.

A

A Pack of ditto, 364 Pounds.

A Load of Bricks 500 ; and of Plain-Tiles, 1000.

A Stone of Fish, 8 lb. and of Wool 14 lb. The same for Horseman's Weight, and also Hay ; but Pepper, Cinnamon, and Allom, have but 13 lb. ½ to the Stone.

Ditto of Glass, 5 Pounds ; and a Seam of ditto 24 Stone.

A Truss of Hay, 56 Pounds ; and a Load of ditto 39 Trusses.

> Note, *New* Hay *in* June *and* August, *ought to be 6? Pound to the Truss ; as per Statute of 2 of* William *and* Mary, 1693.

A Cade of Red Herrings, 500 ; and of Sprates, 1000.

Iron and Shot, 14 lb. to the Stone.

Barrels of sundry Commodities.

Anchovies, 30 lb.

   double Barrel, 60 lb.

Nuts or Apples, 3 Bushels.

Pot-ash or Barilla, 200 lb.

White or Black Plates, 300

Candles 10 doz. lb.

Salmon or Eels, 42 Gall.

Figs, 3 qrs. 14 lb. to 2 C. ¼

Raisins, 1 C. wt.

Oil, 31 Gallons and half.

Spanish Tobacco, 2 C. 3 C.

Gun-powder, 1 C. wt.

Soap, 240 lb.

Butter, 224 lb.

Herrings, 32 Gallons.

Things in Wholesale Trade, bought and sold by the Thousand.

Cuttle Bones.

Oranges and Lemons.

Chair Nails.

Tacks and Tenter-Hooks.

Pomgranates and Tazels.

Goose Quills and **Thimbles**.

Bricks.

Clinkers, or Flanders Tiles.

Billets and Leaves of Horn.

Barrel Hoops.

Squirrel Skins.

Slat and Hilling Stones.

Pins and small Needles, by the 1000 Dozen.

Things sold and bought at Six Score to the Hundred.

Bauks and Barlings.

Barrel and Pipe Boards.

Bomspars and Bow-staves.

Canspars and Caprevans.

Herrings and Deal Boards.

Nails, Eggs, and Cod fish, Cole, Ling, and new Land-fish, Stock-fish of all sorts.

Ells of Canvas, and most Foreign Linnens.

And Hhd Staves.

Of Money.

THE Current Coin of this Nation, is made either of Copper, Silver, or Gold. Of *Copper* is made the Farthings and Halfpence. Of *Silver*, the Pennies, Twopences, Three-

hree-pences, Groats, Six-pences, Shillings, Half-Crowns, nd Crowns : But there is very little Silver coined below the ix-pence. Of *Gold* is made the Half Guinea, the Guinea, nd the 5 Guinea Piece : Befides there are Foreign Pieces of old, that pafs, tho' with fome Scruple as the *Portuguefe ldidore*, at 27 *s.* and the Mil'ed or *French Piftole* at 18 *s.* here are alfo fome few ancient Pieces of Gold of a Pale olour, as being alloyed with Silver, and, therefore may be ckoned the beft, and fometimes called Angel or Crown old ; whereas the old Gold or Broad Pieces are moftly oyed with Copper, which makes them of a redifh Co- ur.

Imaginary Money.

We appropriate feveral Names to Money, of which there no Coin ; as,

	s.	*d.*
he Pound of	20	0
he Mark	13	4
he Noble, or half Mark	06	8
he Angel, or	10	0

In *England*, Accounts are kept in Pounds, Shillings, and nce *Sterling* ; and their Marks are derived from their ames in Latin, *viz. l.* for *Libræ* or Pounds, *s.* for *Solidi* Shillings, *d.* for *Denarii* or Pence, *qr.* for *Quadrantes* or things, 4 making a Penny ; and expreffed or fet down

l. s. d. qr.
4 16 8 2

better thus, *l.* 4—16—8½ ; the Mark for Pounds ftand- before the Sum, denominates the firft Number, and the ers are known of courfe ; for after Pounds follow Shil- s, and after Shillings fucceed Pence, *&c.* When the ce of any Thing is Shillings and Pence, it is fet down

s. d.
4 6

hus, 4 ſ 6: And when Shillings and Pence, and Parts a Penny, expreffed thus, *s. d.*

4 6½

hus, 4 ſ 6½. The latter Way by fome is accounted the ter, and beft Method to exprefs Parts of a Penny or things ; thus,

O

$\frac{1}{4}$ a Farthing, or one fourth Part of what it follows.

$\frac{1}{2}$ a Half penny, or one half of what it follows.

$\frac{3}{4}$ three Farthings, or 3-4ths, or qrs. of what it follows.

And being thus set Fraction-wise, the under Figure shews how many Parts the Quantity before it is divided into, and the upper Figure shews how many of those under Parts the Fraction stands for; as thus, $\frac{1}{2}$ of an Ell, $\frac{3}{4}$ of a Foot, or of Inches; and the same of a Shilling is 9 Pence; of a Pound is 15 s.

If you are to set down 6 Yards and half, write thus,   Yds.   6 $\frac{1}{2}$

     C.

Ninetteen Hundred three Quarters thus,   19 $\frac{3}{4}$

     lb.

Sixteen Pounds and a quarter thus,   16 $\frac{1}{4}$
or else thus, 16 C. $\frac{1}{4}$, 16 lb. $\frac{1}{4}$ 5 Foot $\frac{1}{2}$, 14 Days $\frac{3}{4}$. Here the Name is put between the whole Number and the Fraction, which I think is the plainer and better way : For Example, 6 $\frac{1}{2}$ Hhd may through Ignorance or Wilfulness, be read, 6 half Hhds, as well as 6 Hhds and half.; and at a certain Place where I have had Business, the Warfinger Clerks expressed their half Hhds in this manner.

A Table of the Value of Gold and Silver.

		l.	*s.*
	1 Pound is worth	48	0
Gold	1 Ounce	4	0
	1 Penny Weight	0	4
	1 Grain	0	0
	1 Pound is worth	3	0
Silver	1 Ounce	0	5
	1 Penny Weight	0	0
	1 Grain	0	0

Instrumental Arithmetick.

AS Problems or Questions in Measurement, &c. are solved or answered Arithmetically by the Pen, so also Instrumentally taken by Compasses from certain Lines, &c. or Rules made for that purpose, for the help those that are deficient in Arithmetick, or for a quick dispatch of Business; and such Performances are called Instrumental Arithmetick; and of these Instruments, the most

in Vogue or Ufe, are thefe Three: 1. The Carpenter's plain
Rule 2. *Gunter's* Line.   3. *Coggefhall's* Sliding Rule.

1. *The Carpenter's plain Rule.*

I fhall defcribe and fay fomething of the *Carpenter's
Plain Rule,* in relation to its Ufes, *&c.*

Its Defcription.

*This Rule is made Ufe of in meafuring Board and Timber,
being two Foot in length, and divided into twenty four Parts or
Inches, and every one of thofe Parts or Inches fub divid d into
half Inches, and each of thofe Halves into Quarters, and each
Quarter into two Parts; fo that every Inch is divided into
eight Parts, and the whole Length into 192 Parts.*

*This Rule is well known, and therefore not abfolutely
neceffary of Reprefentation; but however, for the better un-
derftanding it, I fhall give one, thus:*

Under Board Meafure
thus defcribed.

1	2	3	4	5	6	1	7	
12	6	4	3	2	2			
0	0	4	0	4	0			

This Line begins at 6, and goes on to 36, within 4 Inches
of the Rule on the Right-hand.

Its Ufe.

	In. deep.		Feet.	In.	Pts.		
Board be	1		12	0	0		
	2		6	0	0		in length make
	3		4	0	0		a Foot square.
	4		3	0	0		
	5		2	4	5		
	6		2	0	0		

By this Table it is manifeft, and eafily underftood, That
Board of 4 Inches requires 3 Foot in length to make a
Foot fquare, and a Piece of 3 Inches broad will require 4
Foot in length to make a Foot fquare, *&c.*
At the other End of this Rule is a Table called *Under
Timber Meafure;* and thus defcribed,

1	2	3	4	5	6	7	8	
144	36	16	9	4	5	2	2	
0	0	0	0	9	0	11	3	

This Line begins at 8 and half, and goes on (by Divisions) to 36.

In. Square.   Foot.

If a Piece of Timber of
$$
\begin{cases}
1 & 144, \ 0 \\
2 & 36, \ 0 \\
3 & 16, \ 0 \\
4 & 9, \ 0 \\
5 & 5, \ 9 \\
6 & 4, \ 0 \\
7 & 2, 11 \\
8 & 2, \ 3
\end{cases}
$$
in Length make a solid Foot.

By this Table 'tis plain, That if a Piece of Timber 6 Inches square, then 4 Foot in Length of that Piece will make a solid Foot.

It is a common Method with *Carpenters*, to add the Breadth and Thickness of a Piece of Timber in Inches together, and call the half thereof the Square of that Piece; but this Method gives the Content more than it is; and the greater the Difference, the larger the Error. But the true Square may be found in *Gunter's Line*, thus; place one Point of the Compasses upon the Line for the Thickness, half way of that Extent, and that will be the true Square in Inches.

2. Gunter's Line.

This Line is commonly set on the Carpenter's plain Rule, and consists of two Lines, one set at the End of the other, and Distances taken by Compasses, as aforesaid; and it is somewhat of the following Form.

Gunter's Line.

To prove the Line by the Compaſſes, obſerve,

1 to 2	equal	2 to 5
5 to 10	Diſtance	4 to 8
4 to 8	to	3 to 6

To number on the Line.

Obſerve, That the Figures 1, 2, 3, 4, 5, 6, 7, 8, 9, ſometimes ſignify themſelves ſimply or alone; at other times, 10, 20, 30, 40, &c. Again, at other times, 100, 200, 300, or 1000, &c.

To find a Nunber on the Line, as ſuppoſe 134.

For the Figure 1, account 1 on the Line; and for 3, take 3 of the large Diviſions; and for 4 take 4 of the ſmaller Diviſions; and that is the Point. Again, to find 750 on the Line: For 7 take 7 on the Line, for 50 take 5 of the great Diviſions, and that is the Point.

To find a ſmall Number on the Line; as ſuppoſe 12.

For 1, take 1 as before, and for 2 take 2 of the large Diviſions, and that is the Point.

In Meaſuring Board or Timber, it is beſt to have a Line of 2 Foot long, and Compaſſes one Foot long.

Note, *Let the Meaſurement be by the Inch, Foot, Yard, Pole, Rod, &c. it is beſt to have it Decimally divided, or ſo ſuppoſed, that is, into 10 Parts, as the Meaſurement ſhould require, and on the Carpenter's Rule, the Foot ſo divided.*

Note alſo, *That if the Point of the Compaſſes fall off the Line in the Work, remove it to the ſame Figure or Place on the other Line; and the leſſer Extent you take with the Compaſſes is frequently the beſt.*

Multiplication by the Line.

To multiply 5 by 7, Set one Foot of the Compaſſes in 1, and extend the other to 5 Upwards, and with the ſame Extent place one Foot in 7, and the other Foot will fall on 35 the Anſwer.

Di-

Division by the Line.

Example 1. Divide 63 by **3** ; Extend from 3 to 1 downwards, and the Extent will reach the same Way from 63 to 21 the Quotient.

N. B. *In Multiplying you must always extend upwards, that is, from 1, to 2, 3, 4, &c. and, on the contrary, in dividing extend downwards.*

Example 2. Divide 288 *l.* equally among 16 Men : Extend from 16 to 1 downwards ; and that Extent will reach the same Way, from 288 *l.* to 18 *l.* for each Man.

Again.

Example 3. Suppose 750 *l.* were to be divided among 25 Men ; Extend from 23 to 1 downwards ; and that Extent will reach the same way, from 750 to 30 *l.* each Man's Share.

Rule of Three direct.

Example 1. If a Bushel of Barley cost 3 *s.* what will 40 Bushels? Extend from 1 to 3 upwards, and that Extent will reach the same way from 40 to 120 Shillings the Answer.

Example 2. If one Ell of Holland cost 3 *s.* 6 *d.* what will 40 Ells cost ? Extend from 1 to 3 and half upwards ; and that Extent the same way will reach from 40 to 140 *s.* the Answer.

Rule of Three Inverse.

Example 1. Admit the Bushel of Wheat to be worth 3 *s.* 4 *d.* or 40 *d.* and then the two-penny Loaf to weigh 20 *oz.* what shall the said two-penny Loaf weigh when Wheat is worth 5 *s.* the Bushel ? Extend from 60 to 20 downwards, and that Extent the same way will reach from 40 to 13 Ounces and $\frac{1}{2}$ for the Answer.

Example 2. If 136 Workmen fortify a Place in a Month or 28 Days, how many must be imployed to do it in eight Days ? Extend from eight downwards, to 136, and that Extent the same way will reach from 28 to 476 Workmen, the Answer.

The Use in Board Measure.

Example. If a Board be 9 Inches Broad, and 19 Foot Long, what is the Content in superficial square Feet ? Extend from 12, (the Center of Foot Measure) to 9 downwards

wards, and that Extent the same way will reach from 19 to 14 and $\frac{1}{4}$.

In Timber Measure.

Example. A Piece of Timber 24 Inches square, and 8 Foot long, what is the Content in solid Feet? Extend from 22 the Centre) to 24 Upwards, and that Extent twice the same Way will reach from 8 to 32 Foot the Content.

Brick-Work.

How many Rods of Work are there in 4085 Feet? Extend from 272 downwards to 2, and that Extent the same way from 4085, will reach to 15 Rods the Answer.

3. *Coggeshal's Sliding-Rule.*

The next Instrument I shall speak of, is that which goes by the Name of *Coggeshal's Sliding-Rule.* And first of

Its Description.

This Rule is framed 3 Ways; sliding by one another as the Glasiers Rule; Sliding on one Side of a two Foot Joint-Rule; and one Part sliding on the other, in a Foot of Length; the back Part being flat, on which are sundry Lines and Scales.

Upon the aforesaid Sliding-side of the Rule, are four Lines of Numbers, three are double Lines, and one a single Line of Numbers marked (as in the Representation by and by annexed) with *A B C* and *D*, the three marked *A B* and *C*, are called double Lines of Numbers and Figured 1, 2, 3, 4, 5, 6, 7, 8, 9. Then 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10, at the End. That marked *D*, is the single Line of Numbers, and Figured 4, 5, 6, 7, 8, 9, 10, 20, 30, and at the End 40, even with and under 10, in the double Line next to it, and that is called the Girt-line, and so marked in the Figure.

The Figures on the three double Lines of Numbers, may be increased or decreased at pleasure; thus 1 at the Beginning may be called 10, 100, or 1000; the 2 is 20, 200, or 2000; so that when 1 at the Beginning is 10, then 1 in the middle is 100, and 10 at the End is 1000, but if 1 at the beginning is counted for 1, then 1 in the middle is 10, and 10 at the End is 100.

And as the Figures are altered, so must the Strokes or Divisions between them be altered in their Value, according-

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ing

ing to the Number of the Parts they are divided into ; as thus, from 1 to 2, its divided into 10 parts, and each Tenth is divided into 5 parts : and from 2 to 3, it is divided into 10 Parts, and each Tenth into 2 parts, and so on from 3 to 5 ; then from 5 to 6 it is divided into 10 parts only ; and so on unto 1 in the middle of the Rule, or the first part of the double Line of Numbers. The second Part or Radius, is divided into the like Radius.

The Girt-line marked *D*, is divided from 4 to 5 into 10 Parts, and each Tenth into 2 Parts, and so on from ; to 10 ; and then from 10 to 20, it is divided into 10 Parts, and each Tenth into 4 Parts ; and so on all the way from 20 to 40 at the end, which is right against 10 at the end of the double Line of Numbers.

The Lines on the back side of this Rule that slides on one side, are these ; *viz.* a Line of the Inch Measure from 1 to 12, each divided into Halves, Quarters, and half Quarters ; another Line of Inch Measure from 1 to 12, each divided into 12 equal Parts, and a Line of Foot Measure, being 1 Foot divided into 100 equal Parts, and figured 10, 20, 30, 40, 50, 60, 70, 80, 90, and 100 even with 12 on Inch Measure.

And the Backside of the sliding Piece is divided into Inches, Halves, Quarters and half Quarters, and figured from 12 to 24, so that it may be slid out to 2 Foot, to measure the Length of a Tree, or any thing else you have Occasion to measure.

The Use of the double Scale.

Example 1.

Suppose there is a Geometrical Square, whose Sides are 3 Feet $\frac{1}{2}$ each : Set one Foot on the Line *B*, to 3 $\frac{1}{2}$ on the Line *A*; and then against 3 $\frac{1}{4}$ on the Line *B*, is 12 Foot $\frac{1}{4}$ on the Line *A*, which is the Content of such a Square.

$$
\begin{array}{l}
\text{F. } \text{ Pts.} \\
3-6 \\
\quad 3-6 \\
\overline{} \\
10-6 \\
1-9 \\
\overline{} \\
12-3 \text{ Proof.}
\end{array}
\left.\begin{array}{l} \\ \\ \\ \\ \end{array}\right\} \text{Arithmetically.}
$$

In

In this Work by Arithmetick I multiply 3 F. 6 Parts by 3, and it produces 10 Feet 6 Inches ; then I take the half of 3 F. 6 for the 6 Inches (by the way of Practice) because 6 Inches is the ½ of 12, &c.   Again, Suppose there is a long Square, whose Content is 27 Feet ½ Long, and 16 Foot ¼ Wide ; what is its Content ?

27 ½	16 ¼.	F. pts.
The Area 446 Foot, &c.		27,50 Length.
		16,25
		Answer 446,8750 Prod.

Suppose the Side of a Rhombus to be 8 Foot 6 Inches ¼, and the Breadth, or Line *A B*, 8 F. 4 ½, what is the Content : Set 1 Foot on the Line *B*, to 8 Feet $\frac{53}{100}$ on the Line *A*, then against 8 Feet $\frac{52}{100}$ on the Line *B*, is 71 Feet $\frac{40}{100}$ Parts of a Foot on the Line *A*.   And to know the Value of the Decimal, or Part of the Foot look for $\frac{40}{100}$ on the Rule, and you will find against it 4 Inches ¾, so that the Content of this Rhombus is 71 Foot, 4 Inches ¼.

Again, Suppose the Length of a Rhomboides to be 17 *F.*3. or 17 $\frac{25}{100}$ and the Breadth 8 F. 7 or 8 $\frac{58}{100}$ what is the Content ? Set 1 Foot on the Line *B*, to 17,25 on the Line *A*, then against 8,58 on the Line *B*, is 148 Feet on the Line *A*.   The Figure hath been presented before, and operated Arithmetically, therefore here unnecessary.

To measure a Triangle by the Rule.

Every Triangle is half of that long Square whose Length and Breadth are equal to the Perpendicular and Base ; Therefore from the greatest Angle or Corner, let fall a perpendicular Line to the opposite Side (as hath been said before) of the Base, and to find its Content take half the Length of the Base, and the whole Perpendicular, or ½ a Length of the Perpendicular, and the whole Base, and then multiply, &c.

Example.

Let the Base of a Triangle be 4 Foot 1 Inch ¾, and the Perpendicular 2 Foot 1 ¼ : The half of the one, is 2 Foot Parts ; and of the other, 1 Foot 7 Parts. Set one on the Line B, to 4,15 on the Line *A*; then against 1,07 half the Perpendicular on the Line *B*, is 4 Feet and almost ½ a Foot for the Content.   Or if you set 1 on the Line *B*, to

In   O 5   1,07

1,07 on the Line *A*, againſt 4,15 on the Line *B*, is 4, and almoſt ½ a Foot on the Line *A*.

Again, another Way. If you ſet one on the Line *B*, to 4,1 on the Line *A*, then againſt 2,15 on the Line *B* is 8 Foot $\frac{9}{10}$ (which is about 11 Inches) on the Line *A*, the half whereof is 4 Foot 5 Inches ½ which is the Content of the Triangle.

Of the Girt Line.

Suppoſe the Diameter of a Circle be $\frac{25}{100}$ what is its Content? Set 11 on the Girt Line *D*, to 95 on the double Line *C*; then againſt 2 Foot $\frac{25}{100}$ on *C*, the Girt Line is 3 Foot $\frac{28}{100}$ on the Double Scale of Numbers *D*, which is the Content.

Board Meaſure.

Suppoſe a Board to be 27 Inches ½ broad, and 15 Foot ¼ long, what is its Content? Set 12 on the double Scale *B*, to 27 ½ on the double Scale *A*; then againſt 15 Feet ¼ on the double Scale *B*, is 35 Feet, the Content on the double Scale *A*.

When Dimenſions are Feet and Parts, and the Content required in Feet and Parts.

Admit a Board to be 24 ¾ Long, and 1 Foot ½ Broad what is the Content? Set 1 on the double Scale to 1 ½ on the double Scale *A*; then againſt 24 ¾ on the double Scale *B*, is 37 Feet $\frac{1}{10}$ on the double Scale *A*, and is the Content.

Suppoſe a Piece of Glaſing be 29 Inches ½ Long, and 7 Inches Broad, what is the Content? Set 144 (repreſented by 1,44) on the Line *B*, to 7 Inches on the Line *A*; then again 29 ½ on the Line *B*, is 1 Foot and almoſt ½ on the Line *A*.

Suppoſe a Room Wainſcotted of 44 Feet in Compaſs and 9 Foot ¾ high, what is the Content? Set 1 on the double Scale *B*, to 44 Feet ½ on the double Scale *A*; then againſt 9 Feet ¾ on the double Scale *B* is 433 Feet $\frac{9}{10}$ on the double Scale *A*, the Content.

Admit a Piece of Painting 13 Foot ½ Broad, and 23 Foot ½ Long, what is the Content? Set 9 on the double Scale *B*, to 13 ½ on the double Scale *A*, then againſt 23 ½ on the double Scale *B*, is 35 Yards ¼ on the double Scale *A*, and is the Content.

Of

Of Bonds, Bills, Indentures, Letters of Attorney, Wills, and other useful Writings.

Precedents of thefe are very neceffary, not only for the underftanding of them, but to know how to make them authentickly, on emergent Occafions, &c.

A Bond from One to One.

NOVERINT univerfi per præfentes me Abraha-mum Darmell de Parochia Sancti Sepulcherii in Civitate Londini Generofum, teneri & firmiter obligari Jo-hanni Melver de Lond' Armigero, in Quinquaginta Libris bonæ & legalis Monetæ Angliæ, Solvend' Eidem Johanni Melver aut fuo certo Attornato, Executoribus ; Admini-ftratoribus, vel affignatis fuis, ad quam quidem folutionem bene & fideliter faciendam obligo me, Hæredes, Executores, Adminiftratores meos firmiter per præfentes Sigillo Meo Si-gillat' primo die Junii, Anno Regni Domini noftri Geo. II. Dei Gratia, Angliæ, Scotiæ, Franciæ & Hiberniæ, Regis, Fidei, Defenforis, &c. Decimo tertio, Annoq; Domini 1741.

The Condition of this Obligation is fuch, That if the above bounden *Abraham Darmell*, his Executors, Admini-ftrators or his Affigns, fhall, well and truly pay, or caufe to be paid to the above named *John Melver*, his Heirs, Ex-ecutors, or Adminiftrators, the Sum of twenty-five Pounds of good and lawful Money of *England*, in or upon the twentieth Day of *Auguft* next enfuing the Date hereof, with-out Fraud or Delay : Then this Obligation to be void, and of none Effect ; or elfe to ftand and remain in full Force and Virtue.

Sign'd and Deliver'd
in the Prefence of   *Abraham Darmell.*
Gregory Needy,
Thomas Trufty.

A Bill with a Penalty,

KNOW all Men by thefe Prefents, That I *John Jen-kins* in the City of *Chichefter*, in the County of *Suf-fex*, Victualler, do acknowledge my felf indebted to *Martin Moneyman*, of *Eaft Grinftead* in the County aforefaid, Gra-fier, in the Sum of twenty Pounds of good and lawful Mo-ney of *Great-Britain*, to be paid unto the faid *Martin Mo-neyman*, his Heirs, Executors, Adminiftrators, or Affigns,

in

in or upon the 29th Day of *September* next enfuing the Date hereof, without Fraud or further Delay : For and in Confideration of which Payment well and truly to be made and done, I bind my felf, my Heirs, Executors, and Adminiftrators, in the Penal Sum of forty Pounds, of the like lawful Money, firmly by thefe Prefents : In Witnefs whereof, I have hereunto fet my Hand and Seal this twenty-fifth Day of *June*, in the Fifteenth Year of the Reign of our Sovereign Lord King *George* II. and in the Year of our Lord God, 1741.

Signed, Sealed, and Delivered, in the Prefence of　　　　　*John Jenkins.* ☉
Titus Teftimony.
Andrew Affidavit.

A *fhort Bill or Note of One's Hand.*

KNOW all Men by thefe Prefents, That I *Peter Pennylefs*, of the Parifh of *St. Saviour's, Southwark*, in the County of *Surrey*, Blackfmith, do owe, and own my felf to ftand indebted to *Robert Rich*, of the Parifh of *St. Andrew Holbourn*, in the County of *Middlefex*, Gent. in the juft and due Sum of five Pounds, of lawful Money of *England*, which by thefe Prefents I promife to pay unto him the faid *Robert Rich*, at or upon the fixth Day of *October* next enfuing the Date hereof : For the true Performance of which Payment, well and truly to be made, and in Witnefs hereof, I have fet my Hand to thefe Prefents, this fifth Day of *May*, 1741.

Peter Pennylefs.

A *Penal Bill from Two to One.*

KNOW all Men by thefe Prefents, That We *Laurence Lucklefs* and *Peter Pauper*, both of *St. Dunftan Stepney*, in the County of *Middlefex*, Weavers, do acknowledge and own our felves to ftand indebted to *Gabriel Greedy*, of the Parifh of *St. Olave, Southwark*, in the County of *Surrey*, Feltmaker, in the juft and due Sum of ten Pounds, of good and lawful Money of *England*, to be paid unto him the faid *Gabriel Greedy*, his Heirs, Executors, Adminiftrators, or Affigns, in or upon the 14th Day of *October* next enfuing the Date hereof, without Fraud or further Delay ; and in Confideration of which Payment well and truly to be made, We whofe Names are above-written, do bind our

Heirs,

Heirs, Executors, and Administrators, in the Penal Sum of twenty Pounds of the like lawful Money, firmly by these Presents: In witness whereof, We have hereunto set our Hands and Seals, this 15th Day of *May*, in the Fifteenth Year of the Reign of our Sovereign Lord King *George* II. *&c.* and in the Year of our Lord 1741.

Signed, sealed, and deli-   *Lau. Luckless.* ☉
vered in the Presence of   *Peter Pauper.* ☉
Wimbleton Witness.
Timothy Testis.

Note, *That Bills without Penalty are of no more force or lasting than Book Debts, as they are not sealed; yet they are esteemed better Security, because the Party's Hand, if he contends, is to be proved against him: But oft times, on an Adjustment of Accounts, it is usual to have the Party's Hand to the Book, which is as valid as the other; but, in my Opinion, there ought to be a Witness to either of them.*

Note also, *All Obligations must now be in* English, *and may be suited to any Condition, by only altering the Name or Names, Place or Places of Abode, Title or Titles, Sum or Sums of Money, Date,* &c.

An Obligation in English.

KNOW all Men by these Presents, That I *James Jenks*, of the Parish of St. *John Baptist*, in the City of *London*, Haberdasher, am holden and firmly do stand bound unto *Peter Pinch*, of the Parish of *Islington*, in the County of *Middlesex*, Yeoman, in the Sum of fifteen Pounds, of good and lawful Money of *England*, and to be paid unto him, the said *Peter Pinch*, his certain Attorney, his Executors, Administrators, or Assigns, to them or either of them: To the which Payment well and truly to be made, I do hereby bind myself, my Heirs, Executors, and Administrators firmly by these Presents: Sealed with my Seal. Dated the third Day of *August*, in the Fifteenth Year of the Reign of our Sovereign Lord *George* II. of *Great-Britain*, *France*, and *Ireland*, King, Defender of the Faith, and in the Year of our Lord God, 1741.

Note, Thus you may proceed of your self, and save the Charge of going too far distant to a Scrivener or an Attorney, here being no other Charge but the stamp'd Paper, and your own Trouble of Writing.

A

A Letter of Attorney.

KNOW all Men by these Presents, That I *Charles Careful*, of *Lewis*, in the County of *Sussex*, Apothecary, (for divers Considerations and good Causes me hereunto moving) have made, ordained, constituted, and appointed, and by these Presents do make, ordain, constitute and appoint, my trusty Friend *William Wagstaff*, of *Pemsey*, in the County aforesaid, Gent. my true and lawful Attorney, for me, in my Name, and to my Use, to ask, demand, recover, or receive, of and from *A. B.* of *Rye* in the said County, the Sum of forty Pounds; giving, and by these Presents granting to my said Attorney, my sole and full Power and Authority, to take, pursue, and follow such legal Courses, for the recovery, receiving, and obtaining of the same, as I myself might or could do, were I personally present; and upon the Receipt of the same Acquittances, and other sufficient Discharges, for me, and in my Name, to make, sign, seal, and deliver; as also, one more Attorney or Attorneys under him, to substitute or appoint, and again, at his Pleasure, to revoke, and further to do, perform, and finish for me, and in my Name, all and singular Thing or Things, which shall or may be necessary, touching and concerning the Premises, as fully, throughly, and entirely, as I the said *Charles Careful*, in my own Person, ought or could do, in and about the same: Ratifying, Allowing, and Confirming, whatsoever my said Attorney shall lawfully do, or cause to be done, in and about the Execution of the Premises, by Virtue of these Presents: In Witness whereof, I have hereunto set my Hand and Seal, the sixth Day of *May*, in the Thirteenth Year of our Sovereign Lord *George* II. by the Grace of God, King of *Great Britain*, &c. and in the Year of our Lord God, 1741.

A Letter of Attorney by a Seaman.

KNOW all Men by these Presents, That I *Timothy Tarpaulin*, Mariner, now belonging to his Majesty's Ship the *Rye*; for divers good Causes and Considerations me thereunto moving, have, and by these Presents do make my trusty Friend (or beloved Wife) *Henry Hearty*, Citizen and Baker of *London*, my true and lawful Attorney, for me and in my Name, and for my Use, to ask, demand, and receive, of and from the Right Honourable the Treasurer or Pay-master of His Majesty's Navy, and Commissioners of

Prize

Prize Money, and whom elfe it may concern, as well all fuch Wages and Pay, Bounty Money, Prize Money, and all other Sum and Sums of Money whatfoever, as now are, and which hereafter fhall and may be due, or payable unto me; alfo all fuch Penfions, Salaries, Smart Money, or all other Money and Things whatfoever, which now are, or at any Time hereafter fhall or may be due to me, for my Service, or otherwife in any one of His Majefty's Ship or Ships, Frigates or Veffels : Giving and hereby granting, unto my faid Attorney, full and whole Power, to take, pur-fue, and follow fuch legal Ways and Courfes, for the reco-very, receiving and obtaining, and difcharging upon the faid Sum or Sums of Money, or any of them, as I my felf might or could do, were I perfonally prefent ; and I do hereby ratify, allow, and confirm, all and whatever my faid Attorney fhall lawfully do, or caufe to be done, and about the Execution of the Premifes, by Virtue of thefe Prefents : In witnefs whereof, I have hereunto fet my Hand and Seal, this 22d Day of *March*, &c.

Timothy Tarpaulin. ☉

A fhort Will in Legal Form.

IN the Name of God, *Amen*. The twelfth Day of *April*, 1741. I *William Weakly*, of the City of *London*, Haber-dafher, being very Sick and Weak in Body, but of perfect Mind and Memory, Thanks be given unto God : Therefore calling unto Mind the Mortality of my Body, and knowing that it is appointed for all Men once to die, do make and ordain this my laft Will and Teftament ; That is to fay, principally and firft of all, I give and recommend my Soul unto the Hands of Almighty God that gave it, and my Body I recommend to the Earth, to be buried in decent Chriftian Burial, at the Difcretion of my Executors ; nothing doubt-ing but at the general Refurrection I fhall receive the fame again, by the mighty Power of God. And as touching fuch Worldly Eftate wherewith it has pleafed God to blefs me in this Life, I give, demife, and difpofe of the fame in the following Manner and Form.

Firft, I give and bequeath to *Elizabeth*, my dearly be-loved Wife, the Sum of Five Hundred Pounds, of lawful Money of *England*, to be raifed and levied out of my Eftate, together with all my Houfhold Goods, Debts, and move-able Effects.

Alfo

Also, I give to my well beloved Daughter *Elizabeth Weakly*, whom I likewife conftitute, make, and ordain my fole Executrix of this my laft Will and Teftament, all and fingular my Lands, Meffuages, and Tenements, by her freely to be poffeffed and enjoyed. And I do hereby utterly difallow, revoke, and difannul all and every other former Teftaments, Wills, Legacies, and Bequefts, and Executors, by me in any ways before named, willed and bequeathed; ratifying and confirming this, and no other, to my laft Will and Teftament. In Witnefs whereof, I have hereunto fet my Hand and Seal, the Day and Year above-written.

Signed, fealed, publifhed, pronounced,
  and declared, by the faid William   *Will. Weakly.*
  Weakly, *as his laft Will and*
Teftament, in the Prefence of us
the Subfcribers.
    Henry Hardy,
    Samuel Short,
    William Wortle.

Note, *If a Will be already made, and the Perfon hath a mind to alter it, but to add fomething more, there may be affixed the following Codicil or Schedule to it, and it will ftand good in Law, as Part of the Will.*

A Codicil or Schedule to a Will.

Be it known to all Men by thefe Prefents, That I *William Weakly*, of the City of *London*, Haberdafher, have made and declared my laft Will and Teftament in Writing, bearing Date the twelfth Day of *April*, 1741. I the faid *William Weakly*, by this prefent *Codicil*, do ratify and confirm my faid laft Will and Teftament ; and do give and bequeath unto my loving Coufin and Godfon *William Weakly*, junior, the Sum of fifty Pounds of good and lawful Money of *England*, to be paid unto him the faid *William Weakly*, by my Executrix, out of my Eftate : And my Will and Meaning is, That this *Codicil* or *Schedule* be adjudged to be a Part and Parcel of my laft Will and Teftament ; and that all Things therein mentioned and contained, be faithfully and truly performed, and as fully and amply in every Refpect, as if the fame were fo declared and fet down in my faid laft Will and Teftament. Witnefs my Hand this twentieth Day of *April*, 1741.

                      William Weakly.

A Deed of Gift.

TO all People to whom these Presents shall come, I *George Generous* do send Greeting, Know ye, That I the said *George Generous* of the Parish of *Pancrass* in the County of *Middlesex*, Brick-maker, for and in Considera-tion of the Love, Good-will, and Affection which I have, and do bear towards my loving Sister, *Sarah Sorrowful*, of the same Parish and County, Widow ;' have given and granted, and by these Presents do freely give and grant unto the said *Sarah Sorrowful*, her Heirs, Executors, or Admi-nistrators, all and singular my Goods and Chattels, now being in my present Dwelling-house in the Parish aforesaid, known by the Name of *Fisher's Figary* ; of which these Pre-sents I have delivered her the said *Sarah Sorrowful*, an In-ventory signed with mine own Hand, and bearing even Date, to have and to hold all the said Goods and Chattels in the said Premises or Dwelling-house, to her the said *Sa-rah Sorrowful*, her Heirs, Executors, or Administrators, from henceforth, as her and their proper Goods and Chat-tels absolutely without any manner of Condition. In Wit-ness whereof, I have hereunto put my Hand and Seal, this 10th Day of *April* 1741.

Signed, *sealed and delivered*   *George Generous.* ☉
   in the *Presence of*
   Daniel Drayton,
   Aaron Atkins.

Note, *This President may be extended to the giving away of Cattle, Corn, House, or Land, if not Entailed,* &c. *but the Particulars must be named,* &c.

An Indenture for an Apprentice.

THIS Indenture Witnesseth, That *Richard Reynolds*, Son of *Robert Reynolds*, late of *Pemsey* in the County of *Sussex*, hath put himself, and by these Presents doth vo-luntarily put himself, and of his own free Will and Accord put himself Apprentice to *Charles Carpenter*, Citizen and Linen-draper of *London*, to learn his Art, Trade, or Mystery, after the Manner of an Apprentice, to serve him from the Day of the Date hereof, for and during the full Term of seven Years next ensuing : During all which Time, he the said Apprentice his said Master shall faithfully serve, his

Se-

Secrets keep, his lawful Commands every where glad
obey. He fhall do no Damage to his faid Mafter, nor fee
to be done by others, without letting or giving Notice
thereof to his faid Mafter. He fhall not wafte his fa'
Mafter's Goods, nor lend them unlawfully to others. H
fhall not commit Fornication, nor contract Matrimony withi
the faid Term. At Cards, Dice, or any unlawful Game
he fhall not play, whereby his faid Mafter may be dama
ged, with his own Goods, or Goods of others. He fha
not abfent himfelf Day nor Night from his faid Mafter
Service, without his Leave. Nor haunt Ale-houfes, Tavern
or Play-houfes: But in all Things behave himfelf as a faith
ful Apprentice ought to do, during the faid Term. And t
faid Mafter fhall ufe the utmoft of his Endeavours to teac
or caufe to be taught and inftructed, the faid Apprentice
the Trade and Myftery he now profeffeth, occupieth,
followeth; and procure and provide for him the faid A
prentice, fufficient Meat, Drink, Apparel, Wafhing an
Lodging, fitting for an Apprentice, during the faid Tem
And for the true Performance of all and every the faid C
venants and Agreements either of the faid Parties bind the
felves unto the other by thefe Prefents. In Witnefs where
they have interchangeably put their Hands and Seals th
16th Day of *April*, in the 15th Year of the Reign of our Sov
reign Lord *George* II. by the Grace of God, King of *Grea*
Britain, &c. and in the Year of our Lord God 1741.

Note, *If an Apprentice be Inrolled, he cannot fue out*
Indenture, but upon Proof of unmerciful Ufage, want of Vi
tuals, and other Neceffaries, or his Mafter's being uncapab
of teaching him his Trade, or not caufing it fo to be done
his proper Charge by others. And the fame holds good in r
lation to a Miftrefs. But there being no Inrollment, an I
denture may be fued out without fhewing Caufe, in Cities a
Corporations, &c.

A General Releafe.

KNOW all Men by thefe Prefents, That I *Peter Pea*
able of *Haftings*, in the County of *Suffex*, Tobacco
nut, have remifed, releafed, and for ever quit claim to *W*
liam Winter of *Rye* in the County aforefaid, Fifh Chapma
his Heirs, Executors, and Adminiftrators, of all and
Manner of Action and Actions, Suits, Bills, Bonds, Writing
Debts, Dues, Duties, Accompts, Sum and Sums of Mone

eases, Mortgages, Judgments by Confession, or otherwise
obtained, Executions, Extents, Quarrels, Controversies,
Trespasses, Damages and Demands whatsoever, which by
Law, or Equity, or otherwise howsoever, I the said *Peter
Peaceable*, against the said *William Winter* ever had, and
which I, my Heirs, Executors, or Administrators, shall or
may claim, challenge, or demand, for or by Reason, Means,
or Colour of any Matter, Cause, or Thing whatsoever, to
the Day of the Date of these Presents. In Witness whereof,
I have hereunto set my Hand and Seal, this 15th Day of
April, &c.   *Peter Peaceable.* ☉

Some Notes, Rules, Directions, and Monthly Observations, concerning Gardening.

JANUARY, *Aquarius ♒, or the Water-Bearer.*

THIS Month being generally very cold, and the Earth
frozen, there is little to be done in Gardening; but
you may prepare a Mixture of Earth and Sheeps Dung to
rot and mellow together for a considerable time, to layer
your Flowers with; and make ready such Ground as you
shall have occasion for, by Trenching, &c. and dunging
that Part that wanteth, and be provided with Horse, Neat,
and Sheeps Dung of two Years old, and with it mingle
Loam, and under Pasture fine Mould, and stir them toge-
ther, and then skreen it, &c. Uncover the Roots of Fruit-
Trees where there is occasion; and transplant such as you
have a mind to, and set Quicksets; prune and lop Trees,
and gather Scions for grafting before the Buds appear.

FEBRUARY. *Pisces ♓.*

In this Month prune Vines and Wall Fruit-Trees before
the Buds swell; but for the Nectarines, and other choice
Fruit, you may omit it till the next Month; in nailing the
Branches, do not over-strain them, that hindering the Mo-
tion of the Sap; and in a judicial Pruning lies a Master-piece
of Gardening. If the Frost hath killed your Cabbage Plants
set in *September*, sow Seeds now in a hot Bed, made thus:
Dig a Trench according to Discretion, about two Foot deep,
in the warmest Place of your Garden, free from the chilling
Blasts of the North and West Winds; tread it full of Horse-
Litter with the Dung, and cover it with rich Earth, half a
Foot thick; the Earth must be screened or sifted pretty fine,
                                                        and

and cover it with Straw or Mats, in cold Nights only:
fuch Beds may be fown the Seeds of Cucumbers, Mufkme-
lons, or Purflain. The Grafts of former Years grafting
may be now removed. Sow Peas, and fet Beans about
Foot diflant. Alfo now, plant the Slips of Goofberries and
Currants. Mofs your Fruit Trees, and drain your Orchard
and Garden of Wet proceeding from melted Snow or Rain
and fettled at the Roots of Trees, &c.

MARCH. *Aries ♈, or the Ram.*

Dung your Orchard, and plant Trees that remain unfet
cover the Roots of Trees that have continued bare fince Au-
tumn. Sow Carrots, Parfnips, Parfley-Seeds, and Turnip
for Seed. Set Onions and Leeks, and more Beans and Peas
Now you may take off the Litter from your Afparagus
Bed, and, after a little digging or ftirring it, fift fome good
Earth upon it : But if you make a new Bed, make it as di-
rected in the laft Month. Set fhort-ftalked Cabbage-plant
near a Yard afunder, on the Edges of your Carrot-Ground
This whole Month you may graft, cut off the Tops of your
budded Stalks, and prune Grafts of the laft Year.

APRIL. *Taurus ♉, or the Bull.*

In this Month you may fow Scurvygrafs, Carnations
Radifhes, Marjoram, Thyme, Winter-favoury, Purflain
Marygolds, Hyffop, and Lettuce : You may likewife fet
Slips of Rofemary, Lavender, Thyme, Artichokes, &c. Re-
move your tender Shrubs, and flip them after gentle Show-
ers ; and alfo fet French Beans.

MAY. *Gemini ♊, or the Twins.*

Begin to graft in this Month, according as you find the
Buds ready, which take off the Middle of your Sprouts
Fetch out your Greens, and tranfplant them into Boxes fil-
led with good Earth, mixed with one Part of rotten Cow-
Dung, putting Sticks or light Rubbifh to make the Earth
lie light; fo make a Hole for the Water at the Bottom
then fet your Plants therein, but not deep : Water them
and fet them in the Sun.

JUNE. *Cancer ♋, or the Crab.*

In this Month, water new planted Trees, and put rotten
Fern about their Stems. Inoculate Apples, Pears, Wall-
fruit, &c. Lop off needlefs Branches from your Vines, and

op the Joints. Gather Herbs to keep, in the Full of the Moon. You may again fow Radifh, Lettuce, aud Chervil.

JULY. *Leo ♌, or the Lion.*

In this Month, prune Apricocks and Peaches, leaving the moft likely Shoots well placed. Water young planted trees and Layers. Let Herbs paft their Seafon, run to feed; clip Box that grows irregular, after Rain; flip Stocks, plants and Flowers; lay Mirtles, Jeffamines, and other greens. At the End of this Month, fift your Bed of Off-fets of Tulips, Anemonies, Ranunculus's, &c. Sow Ane-mony Seeds in fine fifted rich Earth, either in Beds or Boxes.

AUGUST. *Virgo ♍, or the Virgin Sign.*

Prune off fuperfluous Branches, and Shoots of the fecond fpring; pluck up Suckers from about the Root; inoculate early, if at all, in this Month. Sow Collyflowers and Cab-bages for Winter plants; as alfo Corn-Sallad, Marygolds, Lettuce, Carrots, Parfnips, Spinage, Onions, Endive, An-gelica, Scurvy-grafs, Larks-heel, Columbines, Fox-Gloves, Holyocks, and fuch Plants as endure Winter. Tranfplant fuch Lettuce as you would have abide all Winter; pull up fuch Onions, Garlick, &c. gather fuch Seeds as are ripe, and clip fuch Herbs before the Full of the Moon, an Hand-ful high. Sow Purflain, Chervil, &c. Make Summer Cy-der and Perry, and gather Seeds of fuch Shrubs as are tho-rough ripe.

SEPTEMBER. *Libra ♎, or the Ballance.*

Gather your ripe Winter Fruit be fure in dry Weather. You may yet fow Lettuce, Radifh, Spinage, and Winter Herbs. Tranfplant moft part of Eating and Phyfical Herbs, Artichokes, Afparagus, Roots, Strawberries, &c. As the Weather directs about *Michaelmas,* in fair Weather (but not a foggy Day) retire your favourite Greens, and choiceft plants (being dry) into the Confervatory. When the Cold comes on, fet fuch Plants that will not endure the Houfe, in the Earth two or three Inches below the Surface, and under a Southern Expofure, covered and cloathed with Hay, for their Security againft the Cold of the Night; but open them in Sun-fhiny Days, and again in favourable warm Showers.

OC-

OCTOBER. *Scorpio* ♏, *or the Scorpion.*

In this Month, ir is proper to set Fruit-stones; set them 3 Inches deep, and the sharp End uppermost, and cover them with Straw: Also you may this Month sow Geno Lettuce, which, with small Care, will be good Sallading in Winter; cover them with Bell-glasses in hard Weather.

NOVEMBER. *Sagittary* ♐, *or the Archer.*

Now trench and fit Ground for Artichokes, and plant Trees for Standards and Walls. Also lay in your Cellars Carrots, Turnips, Parsnips, Cabbages and Colliflowers for Seed, to be transplanted in the Spring. Now also take up Potatoes for Winter's Spending.

DECEMBER. *Capricorn* ♑, *or the Goat.*

In this Month, prune Standard-Trees, and Wall-Fruit Trees, Vines, and Stocks for Grafting; set early Peas and Beans, &c.

Before this Head of Gardening is concluded, it may be proper to say something in relation to Inoculating or Grafting.

Grafting is accounted the nicest Piece of Art relating to a Gardener; the meaning of the Word Inoculating or Grafting (being now a familiar Word on another Occasion) is to transform or reform the Fruit of one Tree into that of another, by an artificial transposing or transplanting of a Twig or Scion, a Bud or Leaf taken from the same Tree, or of some other kind, and placed or put to, or into, that of another, called Grafting in the Cleft.

The best time for gathering Grafts is in the middle of *February.* Observe that the Scion is to be cut below the Root.

Grafting in the Cleft.

First cut or saw off the Top of the Stock to a curious Smoothness; then cut two Gashes with a sharp Knife; then with small Wedges, sharpened according to the Bigness of the Graft, being thrust in, raise the Bark of the Stock, and put in the Graft, exactly shaped as the Wedge; then close it hard with your Hand, and bind it about with Clay and Horse-dung mixed. In this manner may any Fruits be grafted, whether Apples, Pears, Plums, Cherries, &c. The Apple is commonly grafted on Crab-Tree Stocks.

T H

THE

FAMILY'S BEST COMPANION:

GIVING

INSTRUCTIONS

for Marking on Linen; how to Pickle and Preserve; to make divers Sorts of Wines of our *English* Product; together with many excellent and approved Medicines, Salves, &c. necessary in all Families.

AS many Things have been spoken to, for the Information of the younger Sort of the Male kind, so it may not be amiss to say some small Matter in relation to the Instruction and Benefit of the Female-kind. And first,

Of Marking.

This is indispensably necessary and useful for the training the younger Sort of the Female-kind to the Needle, it being introductory to all the various and sundry Sorts of Needle-work pertaining to that Sex: Therefore I have set down the Alphabet in Capitals, or Great Letters, and Small, likewise the Figures, that Girls or Young Women, by often practice, may soon attain to Perfection in Marking on Linen. The Marking Copies as follows.

Of Healing, Preserving, Candying, &c.
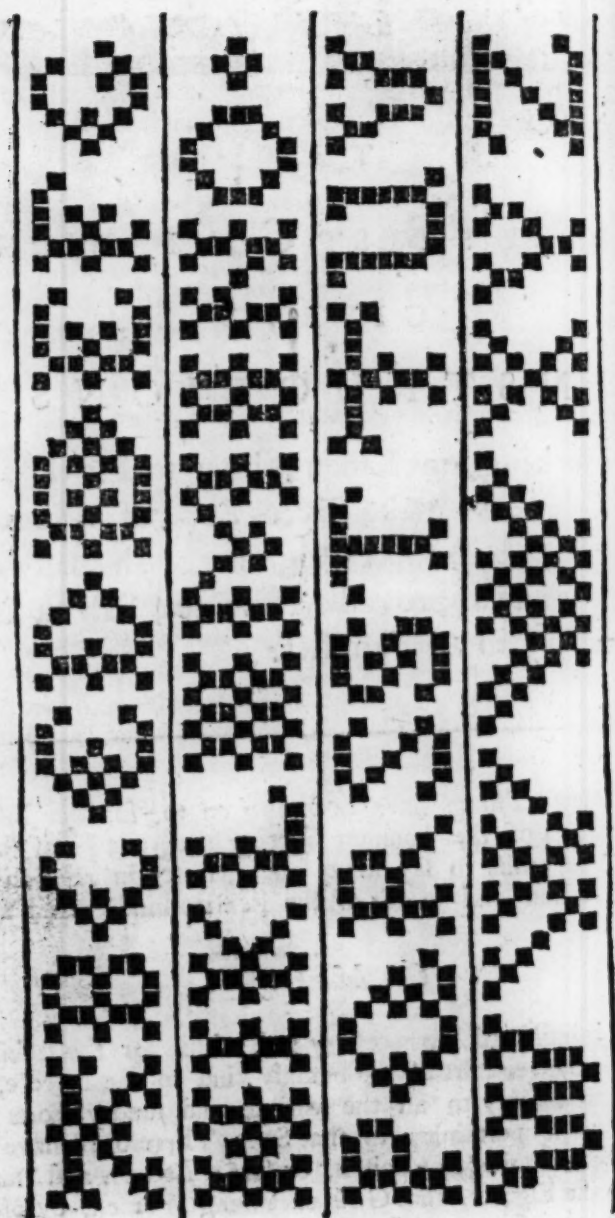
Of Pickling, Preserving, Candying, &c.

To Pickle Cucumbers.

WASH them and dry them in a Cloth; then take Water, Vinegar, Salt, Fennel Tops, some Dill-Tops, and a little Mace; make it sharp enough to the Taste; then boil it a while; then take it off, and let it stand 'till cold; then put in the Cucumbers, and stop them down close, and within a Week they will be fit to eat.

To pickle Cucumbers green.

Take two Quarts of Verjuice or Vinegar, and a Gallon of fair Water, a Pint of Bay-Salt, a handful of green Fennel or Dill; boil it a little, and when cold, put it into a Barrel, and then put the Cucumbers to the Pickle, and you may keep them all the Year.

To pickle French Beans.

Take them before they are ripe, and cut off the Stalks; then take good Wine Vinegar, and boil with Pepper and Salt; season them to your Palate, and let it stand 'till cold; then take the Beans, and put them into a Pot, placing Dill between the Layers, and then put in the Pickle, and cover them close for three Weeks; then take the Pickle, and boil it again, and put it to the Beans boiling hot; cover them close, and, when cold, they will be fit to eat.

Or French Beans may be pickled thus: Take your Beans and string them, boil them tender, then take them off, and let them stand 'till cold; then put them into Pickle of Beer, Vinegar, Pepper, Salt, Cloves, Mace, and a little Ginger.

To pickle Eldern, or any other Buds of Trees.

Give them one or two Walms with Vinegar, Salt, whole Pepper, long Mace, and a little Lemon-peel in Pieces; then drain them, and let the Buds and Liquor cool separately; afterwards put them in a Pot, and cover them with your Pickle.

To pickle Wallnuts to eat like Mangoes.

Take green Wallnuts before the Shell is grown to any Hardness in them; pick them from the Stalks, and put them into cold Water, and set them on a gentle Fire 'till the outward Skin begins to peel off; then with coarse Cloth wipe it off; then put them into a Pot, and put Water and Salt therein, shifting it once a Day for 10 Days, 'till the Bitterness and Discolouring of the Water be gone; then take

a good Quantity of Mustard-seed, which beat up with Vinegar, till it becomes coarse Mustard; then take some Cloves of Garlick some Ginger, and a little beaten Cloves and Mace; make a Ho'e in each Nut, and put in a little of this, then take White-wine Vinegar, and boil them together, which put to the Nuts boiling hot, with some Pepper, Ginger, Cloves, and Mace, as also some of the Mustard and Garlick, which keep close stopped for use.

To pickle Mushrooms.

First blanch them over the Crowns, and barb them beneath, then put them into a Pan of boiling Water, then take them forth, and let them drain; when they are cold, put them into your Pot or Glass, and put to them Cloves, Mace, Ginger, Nutmeg, and whole Pepper; then take White-wine, a little Vinegar, and Salt: So pour the Liquor into the Mushrooms, and stop them close for use.

To pickle any Sort of Flowers for Sallads, as Clove-Gilly-Flowers, &c.

Put them into a Gally-pot, with as much Sugar as they weigh; fill them with Wine Vinegar: To a Pint of Vinegar, a Pound of Sugar.

To pickle Samphire, Broom-Buds, Ashen-Keys, Purslain, &c.

Take Samphire, and pick the Branches from the dead Leaves; then lay it in a Pot, and make a strong Brine of Water, or Bay Salt; in the Boiling scum it clean; being boiled, and cold, put it to the Samphire; cover it, and keep it for all the Year; and when there is Occasion to use it, take and boil it in fair Water, but the Water must boil before you put it in; when it is boiled, and become green, let it cool; then take it out, and put it into a wide-mouth'd Glass, and put strong Wine Vinegar to it, and keep it close for Use.

To Pickle Lemon and Orange-Peel.

Boil them in Vinegar and Sugar, and put them into the same Pickle: Observe to cut them in small long Thongs, the Length of half the Peel of your Lemon: It ought to be boil'd in Water before 'tis boil'd in Vinegar and Sugar.

To preserve green Apricots.

Take them when they are small and tender; peel them and put them in hot Water, but let them not boil; let them lie there till they begin to be green, then take them out, and put them in cold Water, then boil your Sugar, and let your Apricots run a little of the Water from them; then

put them into the Sugar, and let them boil till the Syrup become thick; then put them into an earthen Pan, and let them remain there a Week; then put them into a preferving Pan, and make them boil again till the Syrup grows thick; then put them once more into an earthen Pan, and let them ftand till they are cold; then take them out of their Syrup, and lay them on your Ardoife; then dry them in your Stove, and turn them often till dry; then put them in Boxes on Paper.

To preferve Fruit green.

Take Pippins, Apricots, Pears, Plumbs, or Peaches, when they are green; fcald them in hot Water, and peel them; then put them into another Water. not fo hot as the firft; then boil them very tender, and take the Weight of them in Sugar, and put to them as much Water as will make a Syrup to cover them; then boil them fomewhat leifurely, and take them up; then boil the Syrup till it be fomewhat thick, and, when cold, put them together.

Te preferve Rafberries

Take good Rafberries that are not too ripe, but very whole; take away the Stalks, and put them into a flat-bottom'd earthen Pan; boil Sugar and pour it over your Rafberries, then let them ftand to be cool, and when they are cold, pour them foftly into your preferving Pan, and let them boil till their Syrup be boiled pretty thick; fcum them very well in the boiling; this done, put them in Pots, and when cold, cover them up clofe for Ufe.

To preferve Barberries.

Take one Pound of Barberries pick'd from the Stalks, put them in a Pottle Pot, and fet it in a Brafs Pot full of hot Water, and when they be ftewed, ftrain them, and put to the Barberries one Pound ½ of Sugar, and to them put a Pint of Red Rofe-Water, and boil them a little; then take half a Pound of the faireft Clufters of Barberries you can get, and dip them in the Syrup while it is boiling; then take the Barberries out, and boil the Syrup till it is thick; and, when cold, put them in Glaffes with the Syrup.

To preferve Currants.

Lay a Layer of Currants, and then a Layer of Sugar, and fo boil them as before prefcribed for Rafberries; fcum them in boiling till the Syrup is pretty thick; then take them off, and when they are cold, put them in Gally-pots or Glaffes clofely ftopped.

To preserve Wallnuts green.

Boil the Wallnuts till the Water tastes bitter; then take them off, and put them in co'd Water; peel off the Bark, and weigh as much Sugar as they weigh, and a little more Water than will wet the Sugar; set them on the Fire, and when they boil up, take them off, and let them stand two Days, and then boil them again once more.

To preserve Grapes.

Stamp and strain them; let them settle a while; before you wet a Pound of Sugar, or Grapes with the Juice, stone the Grapes, and save the Juice in the stoning; take them off and put them up.

To preserve Cherries.

First take some of the worst Cherries, and boil them in fair Water, and when the Liquor is well coloured, strain it; then take some of the best Cherries, with their Weight in beaten Sugar; then lay one Layer of Sugar, and another of Cherries, till all are laid in the Preserving Pan; then pour a little Liquor of the worst Cherries into it, and boil the Cherries till they are well coloured; then take them up, and boil the Syrup till it will button on the side of a Plate, and when they are cold, put them up in a Glass close covered for Use.

To candy Cherries.

Take Cherries before they be full ripe, and take out the Stones; then take clarified Sugar boiled to a Highth, and pour it on them.

To candy Pears, Plumbs, Apricots, &c.

Take them, and give every one a cut half through; then cast Sugar on them, and bake them in an Oven, as hot as for Manchet, close stopped; let them stand half an Hour, then lay them one by one upon Glass Plates to dry, and they will appear very fine and clear: In this Manner you may candy any other Fruit.

To candy Flowers.

Pick them very clean, and to every Ounce of Flowers put two Ounces of hard Sugar, and one Ounce of Sugar-candy, and dissolve them in Rose-Water; then boil them, till they come to Sugar again, and when it is almost cold, put in your Flowers, and stir them together, &c.

Of the making sundry Sorts of *English* Wines.

Currant-Wine.

PICK the Currants (when they are full ripe) clean from the Stalks, then put them into an Earthen Veffel, and pour on them fair and clean hot Water, that is, a Quart of Water to a Gallon of Currants; then bruize or mafh them together, and let them ftand and ferment; then cover them for twelve Hours, ftrain them through fine Linnen into a large Earthen Crock, (as they fay in *Suffex*) and then put the Liquor into a Cafk, and thereto put a little Ale-Yeft, and when worked and fettled, bottle it off: This is exceeding pleafant, and very wholefome for cooling the Blood: In a Week's Time it will be fit for Bottling.

Artificial Claret.

Take fix Gallons of Water, two Gallons of the beft Cyder, and thereto put eight Pounds of the beft Malaga Raifins bruifed; let them ftand clofe covered in a warm Place for two Weeks, ftirring them every two Days well together; then prefs out the Liquor into the Veffel again, and add to it a Quart of the Juice of Barberries, and a Pint of the Juice of Bramble-berries, or Rafberries, (which perhaps is the beft) to which put a Point of the Juice of Black Cherries; work it up with Muftard feed covered with Bread Pafte for three or four Days by the Fire-fide; after which let it ftand a Week, then bottle it off, and it will become near as good as, if not exceed, common Claret.

Goofberry-Wine.

The beft way is to take to every three Pounds of Fruit, one Pound of fugar, and a Quart of fair Water; boil the Water very well, but you muft put the aforefaid Quantity of Sugar when it is boiled; bruife the Fruit, and fleep it twenty-four Hours in the Water; ftir it fometimes, then ftrain it off, and put the Sugar to it, and let it ftand in a Runlet clofe ftopp'd for a Fortnight; then draw it off, and fet it up in a cool Cellar, and in two Months it will be fit to drink.

Rafberry Wine.

Take the Rafberries clear from the Stalks; to a Gallon of which put a Bottle of White-Wine, and let them infufe in an Earthen Veffel two or three Days clofe covered; then bruife the Berries in the Wine, and ftrain thro' fine Linnen gently,

gently, then let it fimmer over a moderate Fire, fcum off the Froth, and then ftrain it again, and with a Quarter of a Pound of Loaf Sugar, to a Gallon, let it fettle ; then in half a Pint of White-wine boil about an Ounce of well fcented Cinnamon, and a little Mace, and put the Wine ftrained from the Spice into it, and bottle it up.

Damfon Wine.

Dry the Damfons in an Oven after you have drawn your Bread, then to every Quart of Damfons put three Quarts of fair Water, but firft boil it very well ; then put the Water and Damfons into a Runlet with Sugar ; and having ftood a Time fufficient, bottle it off.

Wine of Grapes.

When they are fully ripe, in a dry Day, pick off thofe Grapes that are ripeft, and fqueeze them in a Fat or Prefs made for that Purpofe, in which muft be a fine Canvas Bag to contain the Grapes ; and when in the Prefs, do not fqueeze them fo hard as to break the Stones, if you can help it, becaufe the bruized Stones will give the Wine a difagreeable Tafte : Then ftrain it well, and let it fettle on the Lees, in fuch a Cafk or Veffel as you may draw it off without raifing the Bottom ; then feafon a Cafk well with fome fcalding Water, and dry or fcent it with a Linnen Rag dipped in Brimftone, by fixing it at the Bouge, by the Bung or Cork ; then put the Wine into it, and ftop it clofe for 48 Hours ; then give it Vent at the Bouge, with a Hole made with a Gimblet ; in which put a Peg or Faucet, that may eafily be moved with the Fingers ; then in about two Days Time clofe it up ; and in about two or three Months Time it will be fit for drinking, and prove almoft as good as French Wine.

Wine of Strawberries or Rasberries.

Mafh the Berries, and put them into a Linnen Bag, as abovefaid for the Grapes, and fqueeze them into a Cafk, and then let it work as aforefaid in the Grape Receipt, &c. In this manner may Cherry-Wine be made ; but then you muft break the Stones, contrary to what was faid before concerning the Grapes.

A fhort Way for Cherry Wine.

Squeeze the Juice of Cherries into a Cafk, and thereto put a fmall Quantity of Sugar correfponding to the Quantity of Juice ; and when ftood a Month, it will be pleafant Liquor.

Black-Cherry Wine.

In the fame Manner, take a Gallon, or more, of the Juice of Black Cherries, and keep it in a Veffel clofe ftopped 'till it works : and after it is fine, add an Ounce of Sugar to each Quart, and a Pint of White-Wine.

To make Cyder.

Grind, ftamp, or pound your Apples, and put them into a Prefs, and fqueeze them through Hair Bags into a Tub, then let it fettle, and according to your Quantity of Juice put in fome Sugar at Difcretion ; then work it up with Ale-Yeft, and let it ftand a Week ; then prepare your Veffel according to the Quantity, clean and dry ; then put it up, after which, put into a Bag two Pounds of ftoned Raifins, two Ounces of whole Ginger, and two Ounces of Ifing-glafs, and fee it tied tight with a ftrong ftring fixed without-fide the Barrel, that the Bag may fink to the Bottom ; and after two Months it will be fit for Ufe.

Mead.

Take fix Gallons of Water, and thereto put fix Quarts of Honey, ftirring it 'till the Honey be thoroughly mixed ; then let it over the Fire, and, when ready to boil, fcum it very well ; then put to it one Quarter of an Ounce of Mace, and as much Ginger, and half an Ounce of Nutmegs, fome fweet Marjoram, Thyme, fweet Briar, together a Handful ; then boil them in the Liquid, then let it ftand by 'till cold, and then barrel it up for ufe.

Of Jellies.

Let them be of Apples, Currants, Rafberries, &c. Take out the clear Liquor (when fqueezed) and boil it with Sugar 'till it is as thick as a Jely ; then put it up in Glaffes.

Family Medicines.

Almonds of the Ears fallen down.

Take a little Bole Armoniac in Powder, and with it mix fome Venice Turpentine, and fpread it on Sheeps Leather as broad as a Stay, and apply it under the Throat, from Ear to Ear.

Ague.

Drink the Decoction (that is the boiling off of any Herb) of Camomile, and fweeten it with Treacle ; which drink when warm in Bed, and fweat two Hours. Or to the Wrifts apply a Mixture of Rue, Muftard, and Chimney-foot, by way of Plaifter.

Afthma,

Asthma, or Shortness of Breath.

Take a Quart of Aqua Vitæ, one Ounce of Anniseed bruised, one Ounce of Liquorice sliced, half a Pound of stoned Raisins, and let them steep 10 Days in the above-mentioned ; then pour it off into a Bottle, with two Spoonfuls of fine Sugar, and stop it very close

St. Anthony's Fire,.

Take a Purge, and anoint the Place with the Marrow of Mutton.

Bruise or Scald Outward.

Take a Quart of Neats-foot Oil, half a Pound of Red Lead, two Ounces of Bees wax ; boil them together three Hours, and stir them well.—Or, Oil of Eldern bathed or rubb'd on the Place, will have the same Effect.

Bruises Inward.

Drink the Decoction of Comfrey with Bread and Butter.

Bound in the Body.

Take Cream of Tartar mixed with Honey, very frequently.

Biles or Sores.

Eat Rosemary and Sage with Bread and Butter, and apply Wheat Flour and Honey by way of Plaister.

Bloody Flux.

Take as much Linnen Cloth as will make a Suppository ; being wrapp'd round Button wise ; wet it in the best Aqua Vitæ, or Aqua composita ; which properly applied, will help them in two or three Applications. This is an approved and sure Medicine.

Bleeding at the Nose.

Put into your Nostrils, Coney-Wool rolled in Bole-Armoniac.

Blood purged.

Drink often of the Tea of Ground Ivy, or of Saffafras Chips.

Canker in the Mouth.

Take the Juice of Plantain and Rose-water mixed, and with it frequently wash your Mouth.

For a Cough.

When you are going to Bed, drink Brandy, Treacle and Sallad Oil, mixed : Or, Take a Mixture of Butter and brown Sugar.

Convulsions in Children.

Take unslacked Lime one Quart, and to it put five Quarts of Spring-water ; let it stand 24 Hours, in which Time stir it three times, scum it, and take the clear Water, and let it stand 12 Hours more, and strain it through a Cloth ; and being put into an Earthern-pot, put to it Anniseeds and Fennel Seeds, of each a Quarter of a Pound ; Liquorice bruised, and Saffafras, of each an handful : Let them stand four or five Days, and then let the Child drink a Quarter of a Pint, Morning and Evening, as long as it lasteth.

Consumption.

Take as much new Milk as a common Still will hold, to which put the Herbs following, *viz.* Hyssop, Cowslip Leaves, Horehound, and Colts-foot, of each a handful ; and of Maiden-hair one Ounce ; let them stand all Night, then still them off ; and when it is to be drunk, sweeten it with Syrup of Cowslips, or good Sugar.

Cholick.

Beat the Hips of wild Roses (gathered in Winter) into Powder, and half as much sliced Nutmeg ; mix them, and take some in all your Drink : This is an excellent Remedy.

To cure Drought in an Ague.

Take a small Quantity of Burridge, Sorrel, Violet Leaves, and Strawberry Leaves ; seeth them in two Quarts of fair running Water 'till it consume to one Quart ; then take Almonds and bleach them, and when beaten, put them to the said Water, and to it put a little Sugar, and drink it warm.

Dropsy.

Take Broom-Ashes, and Mustard-seed steeped in a Pint of White-wine ; of which drink often. *Approved.*

For a Sore Throat.

Take Columbines and Cinquefoil, stamp them, and strain them into Milk, and drink it very warm.

For the Gripes.

Take a sliced Nutmeg in a Quartern of Brandy warmed over the Fire ; to which put the beaten Yolk of an Egg with a little Water and Sugar ; stir them together over the Fire to thicken a little : Take it at Night going to Bed.

For the Stone or Stoppage of Urine.

Take a Quantity of Thyme, Parsley, Tops of Fennel, and Cinquefoil a little Quantity, five or six Cloves of Garlick ; stamp them all together, and strain them into White wine or Ale, and drink of it Morning and Evening.

To cause an Appetite.

Seeth Centaury in fair Water, and drink it in a Morning fasting, to the Quantity of nine Spoonfuls, lukewarm, for three Days,

An easy and safe Purge.

Take Cream of Tartar one Ounce ; Jalop and Brimstone of each a Quarter of an Ounce : The Jalop must first be beaten into fine Powder ; and mix them thoroughly together in a Mortar ; but if the Person be hard to work on, put two Drams of Jalop more.

Small-Pox.

When warm in Bed, drink mulled Ale with Marygold Flowers, and sweat a little, to bring them throughly out ; and to keep them from sinking, take Brimstone and Treacle.

For the Itch.

Take Frankineense and beat it small, and mingle it with Oil of Bays, and therewith anoint all over.

For a Burn or Scald.

Take Oil of Eldern, and anoint the Place : This is a sure Remedy.

Against a Fever.

Take a handful of Bay Leaves, and a large Handful of red Sage ; seeth them in two Quarts of Ale, 'till they come to one, and let the Patient (being in Bed) drink thereof a good Draught warmed, with a little Sugar,

To make an approved Ointment for old Aches, &c.

Stamp Smallage, and add to it some Aqua-vitæ, and Boar's Grease ; stir them well together, and anoint the Place before the Fire, Evening and Morning.

To make Melilot, excellent for Plaisters.

Take Melilot, Pimpernel, and Scabious, of each two Handfuls ; cut them small, then beat them in a Mortar, with two Pounds of Hog's Lard ; let it stand in the Sunshine seven or eight Days, (it being usually made in *June*, then melt and strain it well ; then add as many more fresh Herbs, and set it in the Sun as before, and then melt and strain it again ; then boil it 'till the Juice is consumed ; then take it off the Fire, and put to it beaten Resin, Bees-wax, and *Venice* Turpentine, of each one Ounce ; when cold, put it up in Pots, or make it up in Rolls.

T H E

THE

GENTLEMAN and FARMER'S

NEW GUIDE:

WITH

Good *Advice* to a GROOM.

THE firft Part of this Treatife is to fhew you fomething of the Rule of Management, which is from the Day of Foaling to his latter End. What a Pity it is that fuch a fine Creature as a Horfe is (in his Kind) in whatfoever Bufinefs you put him to, both at Home and Abroad, fhould be abufed! and what bad Ufage there is at this Time committed, for want of a right Management and good Ufage of fome Horfes that are now bred! For when he is well bred, and has not good Care taken of him, he will foon be in the Condition that a great many are.

Having given you a brief Account of the Care you muft take to preferve the Beauty of this noble Beaft; and what Pleafure it is for any Lord and Mafter to fee them in good Health and Profperity: The Choice of your Breeders is the firft Article; then all the reft lies in a right Management, let your Horfes be what Size they will; the Size that you defire your Horfes to be, that Size you muft make choice on for your Breeders; and afterwards the Care lies in the Mafters and Servants that ride and feed them. Thofe Men that love good Horfes, muft always be careful in Riding, and the Groom be very neat in his Stable, and to drefs him very well, and keep him very warm, ftuff his Feet, and greafe his Heels with any frefh Greafe; and when he is hot, don't wafh him, but rub him wel down; give him his Feed in due Time, and always obferve, that his Shoes be faft when he goes out of the Stable, and always keep
your

your Saddles and Bridles in a Readiness : Buy good Hay and Corn, and good Litter, and this is the Bufineſs of a Groom. And he muſt be of good Temper, and not haſty ; if the Horſe commits a Fault, not to beat him with unlawful Weapons, for fear of any Accident, but give him mild Correction 'till he is ſenſible he has committed a Fault; and when he is broke of it, you muſt make much of him, and encourage him in his well-doing. The Rider muſt always be upon his Guard ; you muſt obſerve to take the beſt Road you can, and all Advantages in any hard Labour that you put him to, and not to ſtrain or beat him out of his Wind ; keep him with a ſtreight Rein, for that keeps his Wind, and ſupports his Spirits, ſo that he will go through his Work with Chearfulneſs.

So that every Gentleman or Farmer that would have good Horſes, and preſerve their Health, (which I believe all Men are willing to do) muſt be careful to obſerve all the Points belonging to a Horſe, as to his Feeding, not to fling him a Feed of Corn, or a Bit of Hay that will not do, but he muſt have good Dreſſing, proper Seaſon for his Feed and Exerciſes, which is left to the Care of the Groom, who is not to ride him beyond his Strength. When he goes out of the Stable, give him Time to empty his Body, and do not whip or ſpur him, but mildly ride him.

Keep a good Guard before your Eyes in Riding or Jumping, ſo by your Care you may preſerve your Horſe, and gain yourſelf Reputation from thoſe you ſerve. And when you come to read over this Treatiſe, I don't queſtion but you will find great Satisfaction concerning this noble Creature.

RULE *the* FIRST.

Firſt, You are to take Notice, that I ſhall ſhew you how you ſhall chuſe your Horſes and Mares, and how they ought to be managed in Breeding, &c. There are ſome People of that Opinion, that there is great Difference as to the Colour of a Horſe, but it is my Opinion, there can be little or no Difference in that; for there are good Horſes of all Colours, as well as bad : But the beſt Colours for Beauty are a Coal Black, a bright Bay, or a good Grey, or a Dun is very well ; any of theſe Colours before-mentioned are very agreeable, and moſt likely to prove good Horſes ; on the contrary, Horſes that are bald-fac'd, wall-ey'd, or white Feet, or any Mixture of Colours are not ſo well. Let him

he

be of a true Shape and Make ; if he has a little White on his Feet, or what you call a Star, or a Snip on his Nose, it is an Ornament to a Horse. Those Horses that are of a mix'd Breed are apt to be given to Humours, Running at the Heels or Eyes, and some will be of a malicious Temper ; but see that he be of a good Breed both from Horse and Mare, and then you need not doubt but he will answer your Expectation, if it please God no Misfortunes happen to him.

The next Thing I shall treat on, is the Manner of Breeding, to know the true Size of your Horse and Mare, let them be for Coaching or Hunting. Let your Horse be fifteen Hands high, and the Mare fourteen Hands and a half, for it is proper the Horse should have the Advantage of the Mare, for when the Mare is higher than the Horse, there may happen a great many Accidents to the Horse, by overstraining himself in being too fond of the Mare.

Now I have given you an Account of their Height, I shall proceed to give you some Account as to their Age, which ought to be about five or six Years old when they come together.

The next Thing I shall prescribe, is to give you some Directions how to know the Shape of a Horse, and how he ought to be made. Let your Horse be of a true Shape in all Parts of his Body, let his Head be small, and his Ears the same, and stand upright, his Neck short and thick with a large Mane, well breasted, with a round Body, ribb'd up to his Buttock, with a middle-siz'd Dock, and be sure that his Stones be both come down, and both of a Size, not broken belly'd, well spread behind, his Legs flat and well-jointed, short Pasterns, with his Feet broad at the Heel, his Hoof as black as a Cherry, and his Eyes standing full in his Head, with a brisk Look, and brown as a Berry. And by chusing your Horses, the same Rule is to be observed in chusing your Mares ; be sure let them be both of a Colour, with their Marks both alike, then you will not miss of your Breed ; so when you have a Breed according to your Desire, in right Shape and Colour, and perfectly sound in all Parts, you cannot fail of a good Breed.

But there are a great many Men that have lame Horses or Mares, or blind ones, who will say, I will turn them to Grass, they will serve to breed on, which is a very wrong Notion, and very often infects the Foal ; so that the

same Diſtempers which the Horſe or Mare has, will cer-
tainly attend the Foal.

Now by this great Miſtake Men run into Errors, and take
little or no Care to preſerve thoſe which are ſound and fit
for Breeders, which if they be not bred ſound, 'tis a Thing
impoſſible to make them ſound afterwards.   Courteous
Reader,   I have endeavoured to give you a full Account of
the Manner of chuſing your Breeders in all the Points re-
lating thereto,   I ſhall therefore proceed to give you ſome
uſeful Obſervations concerning the ordering your Foals 'till
they be of Age, and fit for proper Service.

RULE *the* SECOND.

As ſoon as your Mares come to Foal, keep them aſun-
der, for when there are two Mares together, and both have
Foals by their Sides, as 'tis very well known that a Mare
is mighty fond of her Foal, ſo for that Reaſon they ought
not to be together; for if one Foal goes to the contrary
Dam, and ſhe finds it not her own, the Mare will ſpite-
fully bite and kick it, and by that means the Foal may be
ſpoiled, for when they are ſo young and tender, the leaſt
Kick that is may make Cripples of them as long as they
live, and the Care you have taken before is all loſt ; ſo I
adviſe you to keep them aſunder 'till they be a Year old,
which is the proper Age to wean them, and not before,
becauſe their Mouths are ſo tender that it ſtrains their Eyes
with eating of hard Meat, and is apt to bring Humours
into their Heads ; but when they are a Year old, (as I ſaid
before) they may eat Oats or Bran, and good ſhort Hay,
and you may venture to put three or four of them together,
but let them be all Foals ; put none of two Years old with
them, for when they be all of one Age, they will be the
better able to bear the Blows they may give one another ;
ſo that there is no great Danger by putting them together,
and put them in dry Grounds, and give them the beſt of
Hay you can get in the Winter, and all Oats, no Beans nor
Peaſe, becauſe they are ſo hard that it ſtrains a Foal to eat
them.

But when they are about four or five Years old they may
eat them ; and he that looks after theſe Foals muſt take
care he do not learn them any bad Tricks, as to bite him,
or kick him, but ſtroke them with his Hands, and not
to play with them, nor point with your Fingers at them ;

for

for when they have learned any Tricks in their Coltage, 'ti
a hard Matter to break them.

When they come to be fit for future Service, and th
Man that looks after them uses them well, 'and does n
learn them any bad Tricks, then they will be mighty fo
of him, so that there will be a great deal less Trouble whe
they come to be broke; and at four or five Years of Age
Colt will be fit to come under the Care of a Rider or Groom
to be made fit for his Master's Service.

Having now done with the *Second Rule*, I shall proceed
the *Third*, wherein I shall lay down some useful Observ
tions relating to the Duty of the Rider, and how to know
when a Horse is fit for his Master to ride.

RULE *the* THIRD.

When your Horse comes to be four or five Years of Age
which is a proper Time for bringing him to the Busines
you design him for,

The first thing that you have to do, is to bring him int
the Stable for two or three Days, and acquaint him wi
another Horse, and tie him up with a Haltar; and the Ri
der or Groom must make much of him, and after that pu
on him a Bridle, and let him stand two or three Days wi
the Bit in his Mouth, and that will bring him to bear on h
Bit, that you may the better rule him when you come t
back him.

The next thing you are to observe is, you must lead hi
about in your Hand, and lay a Saddle on his Back; or yo
may let a Boy of small Weight ride him for a Week o
more; but be sure take care that he don't throw him dow
for that will give him great Encouragement to commit o
ther bad Faults, and it will be a great deal more Trouble
bring him to his Paces, for he will be always thinking o
one Thing or another that he may quit you from his Bac
which if he once gets any of those evil Habits, you wi
find it a hard Matter to break him, for a Horse is very su
tle, and will be taking all Opportunities that ever he can.

I advise you to keep a good Guard, and let him not g
the upper hand of you; for if he finds he gets the Maste
of you, you will find it a hard Matter to break him, a
said before.

Be sure you keep yourself sober when you are to ride
keep good Bridles, and good Girths and Stirrups for yo

Busines

Bufinefs, but I need fay but little as to the Rider's Bufinefs, becaufe every Man that follows that Bufinefs ought not to have his Bufinefs to learn when he has his Work to do.

So I fhall juft mention two or three Things more. You muft learn him to walk on boldly, not ftopping at a Dog, or a Poft, or any thing of that kind, for when he does, you muft give him good Correction, and you muft walk him back again, and let him know his Fault; then if he goes on well, and is made fenfible that he has committed a Fault, make much of him, and you will quickly find that he will be mightily encouraged in his Bufinefs, and when he comes to walk we l, he will take Pleafure in it, and take his Paces with a great deal of Delight.

When he comes to have a good Mouth, and walk well, and is not frighten'd at little Things that he fees, then you may trot and gallop him, and be fure you well inftruct him in all Points, with a right Management in all his Paces, and when you have brought him to all his Paces according to his Mafter's Defire, then if he comes to ride him, and finds his Temper, and that he carries him well, then the Rider gives him Satisfaction fo far.

Now I hope the Mafter of the Horfe will be encouraged with his Horfe, both for his Profit and for Pleafure, and with as little Trouble as may be, and at as fmall an Expence of breeding a good Horfe as a bad one, with a little more Care of keeping them from Accidents, and chufing your Breeders.

So if any Man has got a good Horfe, let him be for Running or Hunting, or any other Bufinefs, and that Man has a mind to part with him, he may have any Money for him when his Goodnefs is once known, becaufe they are fo hard to be got; for a Horfe is fo fine a Creature in his kind, that every Man that gets a good Horfe which is perfectly found Wind and Limb, he thinks him not too dear, let him coft what he will

By obferving thefe Rules with Care, you may as well have a good Horfe as a bad one, for there are the fame Accidents in bad Breeders as there are in good ones.

R U L E *the* FOURTH.

The fourth Thing you are to take Notice of, is the Office of a Groom, and that his Mafter may know the Benefit of a Servant.

First, The Office of a Groom is to know how to look a
ter his Horses, and how to dress and feed them, and gi
them their Exercise.

The first Thing you do in the Morning, give your Hor
a feed of Corn, then clean your Stable very clean, th
dress your Horse, and a quarter of an Hour after he has e
his Meat, give him Water, and then give him Exercise
a moderate way till he begins to sweat, then you must ru
him well down, and you may pull down his Litter, an
put a little Hay into his Rack, then leave him for an Hou
or two, and then rub him with a Brush; thus his Coat wi
shine, and he will be as sleak as a Mole, if he be in goo
Health, for a Horse shews his Illness by his Coat's staring
the soonest of any Rule you can go by; for if he catch
Cold, you may soon know it by the staring of the Hai
which may be seen before it turns to a Cough.

And if you ride him into the Water, when he is hot, it
a bad thing. or let him stand wet with his Sweat on hi
or in a bad Stable when you are abroad on a Journey, a
a great many more little Accidents that may happen, whi
are too tedious to mention, and which any Man that i
Groom cannot but know; for a Man that has good Hor
to look after, who is a profess'd Groom, cannot but take
great deal of Pleasure to see them in good order, as
Master does who is the Owner of them.

And so the Office of a Groom is to take care that
Horses are kept from taking Colds as much as possible,
not to ride them at a great rate, nor yet to beat them wi
unlawful Weapons when they commit a Fault; and in
Horse's well doing you must encourage him, by shaking t
Bridle, or stroke him with your Hand, or give him some
pleasant thing to eat; so, by degrees, the Horse will be
fond of you, as you are of him.

And the Master of that Servant will, no doubt, take gr
Delight to see his Horses so well managed, and in go
Health.

Now if these Rules shall give the industrious Groom a
Knowledge in this Art, I shall not think my Labour lo
and by these Rules, which are laid down in such a famil
way, that any one who has but little Knowledge in his B
siness may soon be a Master of it; and if the Master h
any Judgment in Horses, he may soon find out when
has a Servant that knows his Business; and then if he

ou have great Encouragement in what you have taken in
and.

A Horse that is sound, and so well bred, which by the
foregoing Rules is set before you, you cannot fail of having
ood Horses, and I hope you will find the Benefit of it ;
hen you come to sell a Horse for 20 or 30 Pounds, in four
five Years, it will requite you for your Trouble ; there is
doubt of it, for a Horse of that Price is as soon sold as
e of five Pounds ; so when you have taken it into Confi-
eration, you will find it as much Profit as Pleasure, and
en you will find what great Mistakes have been made for
me Years past in breeding of Horses for want of Care ;
hich now, at this time, if a Man has got a good Horse
at is right Sound, and of a right Shape, if he has a
ind to part with him, he may have any Money that he
ill ask in Reason for him. What a Pity it is that such a
ble Creature as this is, should be so misused for want of a
ght Management.

How many Writers are there who have taken great Pains
shewing you the Errors and Misfortunes of the Neglect in
ose who pretend to be Breeders of them.

Now I have given you a few plain Rules to go by, at as
all a Charge as I can, and when you come to make a
rial of them, you will find them to answer your End in
hatsoever Business you design your Horse for.

RULE *the* FIFTH.

The *Fifth* Rule begins with some few Directions for buy-
g your Horses, and how to know if they be found. A
an ought to be of good Judgment, and very watchful con·
rning the Points of a Horse, for there are many of the
ealers, and others, who have bad Horses to sell, will have
great many Tricks to put them off if they can. So the
t Thing you are to observe is his Eyes, to see if they be
ll fixed in his Head, with a good brisk Look ; a full and
own Eye is reckon'd the best, but if he has a little blue
e, looks weak, and flags his Ears, that is a great Sign
'll go blind.

If he is very thick under his Jaw, and very narrow, that
another bad Sign ; but if he has a thin Head, his Eyes
nding full in his Head, this is a good Sign that he never
ll be blind. Then you may look round him, and see
Make of his Body, observing that he has a good Shape,
and

and is well ribb'd; and be sure you observe all Parts
his Legs, that he has not got Spavins, or Sinew Strains,
Splints, or Grease-heels, or Ring-bones, or Foundered, or a
other Accidents that may happen of this Kind, or the Po
evil or Fistula; and after you have looked round him, y
may examine into all those Distempers that belong to
Horse, and you must feel with your Hand upon his He
if he has had any Accidents there, and so stroke him to
bottom of his Feet; and if you cannot find any thing a
in him that way, you may ride him easily, and see how
goes, if he walks well, or if he be lame; if you find h
sound, then trot him and gallop him till he begins to swe
and that will give you a great Insight how his Wind
for that is a great Article which belongs to a Horse, th
being no greater Cheat than that among Horses.

There be some Men that will stop the Glanders for two
three Days, but when you come to strain him, you m
soon find it out, for he will fetch his Breath very short, a
heave if he has any Misfortune in his Wind; he will th
his Head about, and blow his Nostrils if he has the Gl
ders. Then you must feel under his Throat to find if he
any Kernels, and if he has, you may reasonably believe
is not in a good State of Health, for he is glandered,
else he has got the Quinsey; be sure to smell up his N
for if he has any of these Distempers, his Breath will
form you of his Distemper; for a Man that is a Deale
Horses, and is employed to buy for any Gentleman,
need to have his Wits about him, if he would keep up
Character; for many a Man that takes all the Care
can, may be cheated, and then the Master he buys
Horse for, thinks he knew of it, and screen'd it wi
Design to cheat him; oftentimes a Man is cheated,
don't find it out for two or three Days. There are so ma
Tricks found out in the Way of Cheating, that 'tis a th
impossible for one Man to find them all out; a good H
being so scarce to be found, that makes so many Tricks
play'd; if a Man buys a Horse, and he proves not so
sound, he would willingly put him off again if he c
Now for want of right Understanding, and good Hon
makes the Art of Cheating be so much in fashion; so
Horse that is right sound, and of a good Make, will be
at any Price.

So every Farmer who has Conveniency for breeding his Horses, will find good Profit in breeding good Horses, and less Trouble, than he will with those that are infirm ; for in four or five Years time they will be fit for Business, let them be for what they will. And if you breed more than that you have occasion for in your own Business, you may have a good Horse to sell, which will be Any-body's Money.

But now many Men who breed Horses make no Choice in their Breeders, for let them be lame or blind, they will have to breed on, which is a very wrong Notion ; so there many a Man, who has but little Experience in Horses, thinks that a lame Horse and a lame Mare, or a blind one, may bring as good a Foal as the best ; and this great will be is the Occasion of so many bad Horses, for the bad Humours that attend the Horse or Mare, very often attend the Foal ; and when that comes to grow up, and is put to Business, the Humours flow about him and put out his Eyes, or fall into his Legs or his Feet, and sometimes turn to the Pole-evil or Fistula ; for it is most certain where Humours abound, they must in Course have a Vent somewhere, and then it is ten to one whether ever he be made found or no so long as he lives.

So by this Misfortune it puts Men upon their Tricks, resolving to cheat somebody or other, if it's possible ; then that Person that buys him, when he finds he is cheated, he next way sets a Farrier to work, and puts himself to a great Expence, but to no Purpose, for he never can be made found, therefore I wish that those who have been, and are, Breeders, would but take the Pains for one ten Years, to follow these plain Directions, I doubt not but you will find great Amendment in your Breeders ; and I hope when you come to make trial of these few Rules that you have before you, they will instruct you further in the Affair of so noble a Creature as a Horse is, when he is so well bred as he ought to be. I have only put down these few Directions, which I think may be of Service to any Farmer that has a mind to have a good Horse to himself.

RULE the SIXTH.

Now the *Sixth* Thing is, to give some Insight into the great Mistakes that are made by Farriers who are not Masters of their Business, and the great Satisfaction of those who are

are Mafters of that Art, doing Juftice to you and him
felf.

There are a great many Men, both in Town and Coun-
try, who are Smiths only, and yet they all pretend to be
Mafters of that Art; they will tell you they have a grea[t]
deal of Fractice, but when a Man comes to try him, per-
haps he knows little or nothing of the Matter; that is [to]
fay, they can be no true Judge in this excellent Science.
Perhaps they may know two, or three, or four Drenche[s],
and three or four Purges, which may be very good if the[y]
were applied properly by an experienced Farrier; I fay, [it]
is not the giving him thefe Drenches, right or wrong, ha[b]
nab at a Venture, that will anfwer the End, but a Ma[n]
muft look well into the Horfe, and be fure he find o[ut]
the right Ailment before he can prefcribe any proper Med[i]-
cine for him to effect the Cure.

Now there are a great many Men who will juft loo[k]
at a Horfe, and no more, and yet they will fay, I will gi[ve]
him a Drench that will cure him; then the Owner of t[he]
Horfe fays, take what care you can of him; fo the Farri[er]
goes to work with him, right or wrong, Luck's all; if [it]
happens to do well, that is, if the Horfe does well, the[n]
that Man is cry'd up for an eminent Farrier; but it [is]
my Opinion, no Man can give a right Sentiment whe[n]
a Horfe's Ailment is at firft Sight, it's a thing impoffibl[e]
they ought to fee how he is in his Body, whether he [be]
bound or loofe, or if he can ftale, and if he can do both
a Man cannot tell by juft looking on him, he may ha[ve]
a Pain in his Bowels, or a Griping in his Belly, or he ma[y]
have a Pain at his Breaft; fo by the Horfe's Motion of h[is]
Head, and ftamping with his Feet, gives the Rules yo[u]
muft go by to find out his Diftemper, for 'tis a thing im-
poffible for a Man to know, that don't ftay two Minut[es]
with him, and the Drenches he gives him may as well k[ill]
him as cure him, it has the fame Chance; now this is t[he]
Miftake that is made by Farriers.

For if any Man is a Judge of the Signs of Horfes M[o]-
tions, and the Rules they make for you to go by, whi[ch]
when a Man has rightly found out his Diftemper, he c[an]
beft judge how to apply proper Remedies for his Dift[em]-
per, let it be what it will.

Now if a Horfe be griped in his Guts, or in his Bow[els,]
or if he be bound in his Body, and the Wind cannot bre[ak]

Way through him, that puts the Horse into violent Pain, and makes him strain to dung and stale, and can do neither; and if a Man has not a right Understanding of his Distemper, but gives him a strong Purging Drench, thinking to carry it off, that is the Way that many a Horse is killed, or where one is cured, two are killed by this very thing; I know it to be true, for their Purges must be very strong made, or else they could not work so soon as they do, for they are made of Jallap, Aloes, and Quicksilver: and if the Horse can neither dung or stale, how can his Physick work? No, not at all, for he can bring nothing upwards, and for want of working downwards, his Belly will swell like a Drum, and he will die in two or three Hours Time. Don't you think this Man has committed a great Error in so doing? Yes certainly, for now I will shew you how, and in what manner he might have prevented this grand Mistake, I will leave you to judge of the same; for when a Horse is bound, he ought to be rak'd, and that very well, then give him a Clyster that is proper, then see how he goes on a little while, and if you see Occasion you may rake him again, and give him another Clyster, and when you have so done, you may give him a Purge, and when you can get the Physick quite through him, there can be no great Danger of killing him.

It's not a Man's knowing all the Drugs in an Apothecary's Shop, nor all the Herbs in a Field, that can make him Master of his Business; for a Man that is Master of that Art, is to find out all the Distempers that belong to a Horse, and where his Ails lie, then if he knows that, he will always have a Caution how he must make his Remedies, for fear of Accidents, for sometimes a thing that is mild takes as much Effect as the strongest thing you can prepare; for when a Horse is in this Condition, as I have been speaking of, and you give him a strong Dose of Physick, it checks it, and is a present Remedy, Kill or Cure; and if a Man cures one Horse, and kills another, I am sure that can be no Judgment, but a great Folly, both to his Master and himself, if he were made sensible of it by a Man that is a Judge of it.

And the same Rules are to be observed in outward Accidents, that is, any old Ulcers that have been of a long time standing; when you send for a Farrier, and he looks upon it well, he will say, Sir, I hope I can cure it, then

he

he goes to work for a Week or a Fortnight ; then the Ma
ter wants to know if he thinks he will do well or not, the
he fays, I am in Hopes he will, and perhaps he knows n
more than he did the firft time of his coming to him ; an
this is the way of a great many Farriers who are not Mafter
of their Bufinefs ; but a Man that is Mafter of his Bufinef
can partly tell if he can make a Cure, or not, in that time
or whether the Ulcer proceeds from the Flefh or Marrow;
it proceeds from the Flefh, it may be cured, but if it pr
ceeds from the Marrow, it cannot be cured, for many time
the Humours proceed from the Dam, and if it happens
their Heads, or upon their Backs or Legs, then there ca
be no Cure fo long as he lives ; but if a Man will, he ma
tell his Mafter he will do well, and fo carry it on a lo
time, and at laft he fays it has got to the Bone, and cann
be cured.

Now there is all your Charges loft, befides the keepin
of the Horfe : What a Folly is this in thefe Men, who kno
no better? And this is the Miftake which thefe make
Farriering.

I will now give you fome Encouragement in what Ca
a Man takes that is a Judge of it, for his own Charact
and in Juftice to his Mafter : When you fend for this Fa
rier to fee the Horfe, and if he be Sick or Lame, he w
ftrictly examine into him to find out his Illnefs, and wh
he has fo done, he will tell you the beft of his Judgmen
if he is very bad, he will tell you he is afraid he will d
but fays, if you pleafe, I will give him fomething tha
proper for him, and take all the Care I can. Then he w
give him a mild Drench or two, that will work mildly up
him, which is far better than a ftrong Dofe of Phyfick
kill him, for Nature will do its Part ; this is the Judgme
of a Man that does Juftice both to you and himfelf;
in a Week or Fortnight's Time he can tell whether he c
cure him or not ; this is the Truth and Juftice of a M
that is Mafter of his Bufinefs.

And 'tis all the fame in Lamenefs, for if it be an Ulc
he can tell you whether he can make a Cure or no in a fh
Time ; for if a Man be Mafter of his Bufinefs, he will j
ly tell you his Opinion ; for if his Medicines do not t
Effect in a fhort time, he has no Hopes of a Cure, but i
takes Effect in a little time, there is Hopes, and he
take all the Care he can to make him found ; and tha

the true Rule of a Farrier to find out the Nature of his Diſtemper; then when he has found out his Diſtemper, he makes up his Remedies accordingly.

And I hope you will allow that Man to be a Judge in this Affair, for he takes as much Pains in it as a Doctor or an Apothecary does of his Patient; for ſometimes he has that Bleſſing, that he can tell where the Pains lie, and how a Horſe is in his Body by the Motion he makes with his Head, or his Legs, for there are no other Rules to go by, or if a Man be Sick, and ſends for an Apothecary, he firſt tells him where his Illneſs lies before he can proceed to give him any Thing, which is the very ſame Caſe, for if he don't know his Diſtemper, he can never make a Cure, but all the while he is picking your Pocket by his own Ignorance, and there are a great many have found it ſo, I am very well aſſured on't, for there are a great many Ulcers in all Parts of a Horſe's Body that can never be cured, for they bring them into the World with them. Sometimes they breed by a Pinch or a Blow, or a Prick that may happen, and the Humours ſettle there, which can never be cured; you may give him Eaſe for a little while, and that is the reaſon there are ſo many Horſes loſt by not having good breeds, and thoſe that are not perfect ſound, tho' a Horſe that is ſound has Accidents happen to him, yet take it in time, and a Man that is a Judge ſeldom fails of a Cure, becauſe there are no bad Humours attend it; but the Anguiſh only that a Horſe receives in his Wound.

RULE *the* SEVENTH.

Seventhly and laſtly, I ſhall ſhew you ſome brief and plain Rules concerning your Horſe's Health, and how your Care ought to be taken, and how Accidents may be prevented, which has been greatly neglected both by Maſters and Servants.

Now concerning Health, which is the firſt and principal Thing, I ſhall ſhew you, that when you have taken all the Pains, and followed all the Rules which I have given you, for the breeding and preſerving your Foals 'till they be fit for the Buſineſs which you deſign them for, then Care muſt be taken as to their Exerciſe and Work, let a Foal's Buſineſs be what it will, if you uſe him well, he will take a great Delight in his Buſineſs, as well as you do that ride him; and be ſure you don't ride him out of reaſon, one Gentleman

Q   againſt

against another, by making of Matches, one striving again[st]
another as long as they can run ; you must think it will b[e]
a great Detriment to him in so doing, which may endan[ge]
ger his Health, by giving him Heats and Colds, whic[h]
oftentimes endanger his Life, if great Care be not tak[en]
afterwards.

There is another bad Article, and that is in Huntin[g]
some Gentlemen, when the Sport begins, will ride as ha[rd]
as they can, and as much more Ground as they need, an[d]
if the Sport holds long, (which oftentimes it does) then h[e]
that takes Care, and rides softly at first, will be the first th[at]
comes in ; so you whip your Horse, and strain him to g[et]
in as soon as possibly you can ; thus by want of Care an[d]
Judgment you spoil your Horse by so doing, and weake[n]
his Constitution, and sometimes break his Wind, or oth[er]
Accidents of this Kind ; for a Horse has a bold Spirit, an[d]
if you keep no Guard on him, what can you expect b[ut]
to destroy him of his Health ?

There is another bad Article, and that is, in jumpi[ng]
your Horses ; you must give him proper Time to take h[is]
Leap, (that is at a Stile, or a Gate) for if you check hi[m]
he will be apt to slip, then if his Legs should happen [to]
slip into the Gate or Stile, he may spoil himself by o[ne]
Means or another, which is a great Fault committed by n[ot]
taking Care ; and sometimes by jumping at a Hedge, or
deep Ditch, when you have been riding hard, you shou[ld]
have a great Care, for when you find your Horse wea[k]
you ought not to spend him ; for if he drops on the Hed[ge]
'tis ten to one but he stakes himself ; and sometimes wh[en]
he is weak, and jumping at a Dike, he tumbles backwa[rd]
into the Dike, and a great many more Accidents may ha[p]
pen by those who are not careful in Riding, and are n[o]
Judges therein, I will therefore give you a Rule or tw[o]
in a brief Manner concerning Riding, that is, if your Ho[rse]
be of a bold Courage, you must always be upon your Gua[rd]
keep yourself in a steady Posture upon his Back, and dra[w]
him in with a steady Hand, and not spend him at all ; the[n]
if you should have any Occasion to jump him, give hi[m]
proper Time to take his Leap, then he will be chear[ful]
and not disheartened ; let him have his Head by a stea[dy]
Hand, then he will perform his Work to your Mind, a[nd]
always observe to favour him as much as you can.

N[a]

Now if the Sport or Exercife you follow fhould hold long, your Horfe will come in the firft, and have the Pre-eminence of the Field, and this is the Art of Riding ; and you that have a good Horfe, and are defirous to preferve his Health, muft always obferve to let him have all the Advantage you can give him in hard Riding ; for a Horfe of a bold Courage, when he comes among other good Horfes, will work one againft another, let their Bufinefs be what it will.

And you that ride them, Mafters or Servants, if they be good Horfes, and you give them their Liberty to do what they will, they will break their Conftitutions, and deftroy their Health, and a little Time they will come to be Food for the Dogs, and are deftroy'd in the Prime of their Years.

But a Man that is a Judge in Riding, and preferves his Horfe's Health, then he will have his Pleafure in feeing what a fine Creature a Horfe is, when he is in perfect Health, and how he will perform his Bufinefs with all the Pleafure imaginable ; for all Men upon Earth will allow that a Horfe is the ufefulleft and fineft Beaft in the World ; fo the Thing you are to do, is to chufe good Breeds, and the laft chiefly depends upon your Care.

Now I have gone through the Seven Rules, fhewing you all the plaineft Methods which by any Means I could find out, and I hope thofe that defire to dive into this Affair, will make Ufe of them, and I hope with the Bleffing of God, and your Endeavonrs, you will find they will anfwer your Ends, to your entire Satisfaction.

The next Thing I fhall take Notice of concerning this noble Creature, is his true Shape, and the Points, which are in Number 32, as you will find by the following Scheme,

1*ſ*, The Hoof.	1
2*d*, His Coffin-Joint.	2
3*d*, His Pafterns.	3
4*th*, That is, his fhort Joints.	4
5*th*, His Shin-bone.	5
6*th*, The Knees.	6
7*th*, That is, from his Knees to his Shoulder.	7
8*th*, His Shoulders.	8
9*th*, His Breaft.	9
10*th*, His Neck.	10
11*th*, His Ears.	11
12*th*, His Forehead.	12

13*th*, His Eyes
14*th*, The Hollowefs of his Brows.
15*th*, His Jaws.
16*th*, His Noftrils.
17*th*, His Mouth.
18*th*, That is, the true Shape of his Head.
19*th*, His Mane.
20*th*, His Withers.
21*ft*, His Back.
22*d*, His Sides.
23*d*, His Belly.
24*th*, His Flanks,
25*th*, His Rump.
26*th*, His Thighs.
27*th*, His Stones.
28*th*, His Tail.
29*th*, His Truncheon.
30*th*, Like a Stay, lower before than behind.
31*ft*, His Hams.
32*d*, That his Hoofs be large and crooked, like thofe of a
        Hart.

Now the Number of Points are particularly fet down
in the aforefaid Scheme, and they are all in the Number
of the Seven Rules concerning the Shape of a Horfe; fo
if thefe Points be all well fixed one to another, then he
is fa'd to be a well-fhaped Horfe; and they be as true as
ever I could find out in any Rule I could go by.

In the next Place, I fhall proceed to give you fome Ac-
count of the true Frame of a Horfe's Body, that is, the
Number of his Joints, and how they are placed, which may
be of Service to you, if they fhould happen to be out of
Joint; for there is no certain Cure; but for a Strain there
is Help, if proper Remedies be applied for the fame.

I will in the firft Place begin at his Head, which is
his Forehead, and the lower Part of his Jaw, which are
    And from the Top of his Head to the End of his
Tail, are
    The Breaft Bone is fixed to the Ribs, and fupports
the Shouders, which is but

Brought over 59

And the Joints that are from the Coffin-joint to the Top of his Shoulders, and all their Supporters that uphold the Joints of both his Fore-legs, are 22

And the Number of Joints of his Hind-Legs from the Coffin-joint to the Hip-bone, or his Rump, or his Dock, are 24

And his Ribs are the Proposal of his Body.—And there are as many short Ribs as there are long ones, which are to strengthen his Back, and a Guard for the other Ribs, so that he is able to carry his Burthen, so that his Back be not broke. 32

So the Total Number of what you may call proper Joints, is 169

Courteous Reader, I have now set down the Number of Joints belonging to a Horse as near as I can, according to the best of my own Judgment, which you will find set down in the Scheme above-mentioned, which are 169. Some affert there are 177, but they cannot properly be called Joints, for they are only little Supporters that attend the Joints to strengthen them, and to keep them in their proper Places; or else how could the Horse bear his Labour, or such heavy Burthens as they carry. If they were not well fixed, and made of a wonderful Strength, they could not endure it, for it is thought he is one of the strongest and finest Creatures in the World, and the most serviceable of any Beast whatsoever; and so every one ought to think it a great Blessing, that God Almighty has given them the Benefit and Use of such a noble Creature as a Horse.

Having now gone through the Seven Rules, which I have endeavoured to lay down in a plain Manner, so that any one may understand it that can read; I heartily wish, that they whose Hands this Book shall light into, would take as much Delight in making Use of it, to follow the Directions I have given them, as I have done in penning it: All which cannot but be of Use, as well as Diversion, to all those who delight in good Horses.

For
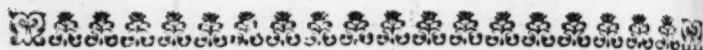
For the Remedies, if Accidents happen.

NOW concerning this Affair, I shall give you some Account in the other Part of this Book; that is, concerning the Remedies which I have prescribed in Sickness or Lameness; you will find Receipts for all Kinds of Distempers, which I have found to be good by my own Experience, and very safe, if they be rightly prepared, according to the Distemper, by a Man of Judgment.

Now I have put you in a Way how the Horse is to be managed during his Sickness or Lameness, and how to prepare his Physick without any Danger, and if a Man can but find out his Il'ness, 'tis but your looking into the Book, where you may find a Remedy for his Disease, which if one won't do, you may give him another when you think proper, without any Danger at all, for there are no strong Doses of Physick to gripe him, or rack him to Death in two or three Hours Time, as many have done by giving them those strong Doses, for Nature must do its Part; and if any Ulcers happen, you have likewise Remedies for them also, which I hope will answer your Expectation, and give you good Satisfaction in what you take in Hand.

The End of the FIRST PART.

PART II.

THERE are many Farriers and Grooms who are of that Opinion, to purge and bleed their Horses three or four Times in a Year, let them be sick or well, it is all the same; which I think is a quite wrong Notion, for if a Horse be in good Health, there can be no Occasion for Purging or Bleeding, for the good Blood comes from him as well as the bad; and Purging puts the Horse out of Order when he is well, so I cannot find any Reason for it when he is in a good State of Health; but very often wants good Dressing, good Feeding, and good Exercise, except the Horse has been used to it, or has Humours attending him, then Purging and Bleeding is proper, for he will not do without it; or if any Accidents happen to him, Purging and Bleeding is very proper, and here you will find Remedies for the same.

1. *A Clyster for a simple continued Fever.*

Take Mallows and Marsh-mallows, of each a large handful, Camomile half a handful, Fennel-seeds three Drams, or half an Ounce; bruise them and boil them in three Quarts of Water 'till one Quart be consumed; then strain it through a Sieve, and dissolve it in three Ounces of Lenitive Electuary, and a quarter of a Pound of Hog's Lard, Oil, or Butter.

2. *His Water Drink.*

Put a Quart of Water, with two Ounces of Salt of Tartar, into a brazen Pot with a Cover, and set it over the Fire 'till the Salt be dissolved; then pour the Water into a Pail, and after the same Manner dissolve one Ounce of Sal Armoniack beaten to Powder, into another Quart of Water; mix this last Solution with the former, and fill up the Pail with common Water, and if your Horse refuse to drink it, add a little Barley Flour to qualify the unpleasant Taste.

3. *For a Sweat.*

Take three Pints of Milk-water, and diffolve in it an Ounce of Mithridate; and when he begins to fweat, give him warm Water to drink, and clothe him up warm. If the Fever ends with Rheum from the Mouth and Nofe, boil a Handful of Red-rofe Leaves in a Quart of Water, diffolve in it an Ounce of Diafcordium, to be given as a Drench.

4. *For a Surfeit.*

Take Sena one Ounce, fweet Fennel-feeds, Coriander, or Caraway-feeds, of either, half an Ounce, Salt of Tartar one Dram; infufe them in a Quart of boiling Water, pafs it through a Sieve, and add to it an Ounce of the Powder of Jallop; to be given in the Morning, and the Horfe kept fafting for the Space of four Hours before and after it; when it begins to work, his Water fhould be warm, ftrewed with Oatmeal, or Barley flower, and nothing given that is cold.

5. *Starves or Staggers, a Clyfter.*

Take two bitter Apples, boil them in five Pints of Water, pour off the Liquor, and mix with it three Ounces of the Juice of Buckthorn Berries, or four Ounces of the Syrup; the fame Quantity of Oil or Butter.

6. *Another for the fame. A Purging Drench.*

Boil one bitter Apple in a Quart of Beer, ftrain it off, and when it is almoft cold, add to it an Ounce and a half of Jallop, and two Drams of Diagridium; thefe may be repeated two or three times, if the Horfe has Strength to bear it.

7. *For his Dreffing.*

He ought to be exercifed and rubbed very well down, and while he is under fuch Courfes of Phyfick, his Water fhould be warm, and fprinkled with Oatmeal.

8. *For a Wound or Blow on the Eye.*

The firft Thing to be done in this Cafe, is to open the Neck-vein, taking from thence a moderate Quantity of Blood, and after that, take Conferve of red Rofes, fpread it pretty thick on a Pledgit of fine Flax, or clean Hurds, and

and lay it over the Eye, applying at the fame time above the Eye-pits, and about the Temples, Flax dipped in a Charge made with Vinegar, the White of an Egg, and Bole Armoniack ; this, by allaying the Heat, will put a Check to the Blood.

9. *For Rheum and Inflammation in the Eyes.*

Take white Vitriol half a Pound, Roch Allum three Quarters of a Pound, an Ounce and a half of Bole Armoniack, Litharge half an Ounce ; reduce all thefe to Powder, then put them into a new glazed earthen Pot, with a Pint and a half of Water ; boil it over the Fire without Smoke gently, till the Water is all evaporated, and the Powders are perfectly dry at the Bottom, fo let it remain till the Matter is cold. This is called the *Lapis Mirabilis*, or the *Wonderful Stone.*

Put half an Ounce of this Stone in a Glafs Bottle, with four Ounces of Water, it will make the Water as white as Milk in a quarter of an Hour ; wafh the fore Eye Morning and Evening with the Water or Solution. A Solution thus made will keep twenty Days.

10. *A Receipt for the fame.*

Take *Roman* Vitriol and Bole Armoniack of each one Ounce, Camphire a quarter of an Ounce, powder them together, and put half an Ounce of this Powder into two Pounds of boiling Water, ftir it well about, then take it off the Fire, and let it fettle and decant off what is clear by Inclination. This is an excellent Remedy, and may anfwer the End as well as the other ; it may be made ftronger or weaker, as the Practitioner fhall fee Occafion.

11. *For Lunatick or Moon Eyes.*

The chief Thing that is to be done is Purging, but firft open him with a Clyfter or two, and then let Purges be given him as follow : Take of the cleareft fhining Aloes two Ounces, Turbith Root in fine Powder half an Ounce, Diagridium two Drams, Liquorice Powder four Ounces ; make them into large Balls with a fufficient Quantity of frefh Butter ; let thefe be given in Ale to wafh them down.

12. *A Purge.*

Take Aloes and Jallop in Powder of each one Ounce and a half, Cream of Tartar three Ounces, Diagridium one Dram, let this be given in a Quart of Ale without warming, or it may be made into a Paste with Liquorice Powder and Butter as the other ; and the Cream of Tartar may be diffolved in warm Water, and given him after it begins to work ; and the Horfe muft be purged very often if his Strength will bear it. And to wafh his Eyes you will find a Receipt in Page 345. No. 10. for *Eye-water.*

13. *For Films, Webbs, or Dimnefs of Eyes in Horfes.*

Take unflacked Lime four Ounces, and pour upon it a Quart of boiling Water, and after 'tis clear, pour it off gently from the Lime, and then filter it through brown Paper into a clean Brafs or Copper Pan, and diffole in it one Ounce of Crude Sal Armoniack, letting it ftand in that Veffel till it turns to a very beautiful blue Colour, then filter it as before ; let four or five Drops of this Water be inftilled every Day, once or oftner, as there fhall be Occafion, into the Horfe's Eyes : This Water will keep a long while, and is not only ufeful to Eyes, but to wafh all old obftinate Ulcers, and therefore may at any Time be made in larger or leffer Quantities as you think proper. He ought to be bled, purged and rowelled according as you find him in Cafe to bear it.

14. *For cold Clyfters.*

In the Beginning for a Cold, Bleeding and Clyfters. Take Mallows and Marfh-mallows of each three Handfuls, boil them for the Space of half an Hour in three Quarts of Water, and ftrain it off, add to it half a Pound of Treacle, coarfe Sugar or Honey, and the fame Quantity of Oil or Butter ; let it be Blood-warm, and repeated as often as needful, and hold the Tail as clofe to him as you can.

15. *For a Clyfter, a Drench, or Balls.*

And after the laft give him Garlick, Onions, Brimftone, Honey, Barbadoes Tar, or common Tar; they often fucceed, and that very foon.

16.

16. *A Drench.*

And after the Drench, to sweat him, give him an Ounce of Venice Treacle in a Pint of Treacle-water, and clothe him warm, and he will sweat; dress him, and give him moderate Exercise; and take care that he don't get any fresh Cold on him.

17. *For Chest-Foundering.*

Bleed your Horse in the Inside of the Thigh, which will be found much more safe, and answer the End much better than Bleeding in the Neck; then give him a Clyster that is for a Cold.

18. *To Sweat him.*

Take Milk-Water one Pint and a half, Treacle-Water half a Pint, dissolve in the Treacle-Water six Grains of Camphire; then add an Ounce and a half Mithridate, or two Ounces of London Treacle; mix all together, and give it to your Horse.

19. *For Balls.*

Give him one in the Morning, and one at Night. Take Conserve of Red Roses two Ounces, Spermacety one Ounce, Linseeds and Fenugreek-seeds in Powder, of each one Ounce and a half, Liquorice Powder two Ounces; let these be made into four Balls, with Sweet Oil, or Oil of Sweet Almonds; by Degrees give him his Exercise, which with a cleansing Diet will perfect the Cure. Give one Ball an Hour before watering Time.

20. *For Broken-winded Horses.*

Take four Heads of Garlick, one Ounce of Horse Radish, stamp them in a Mortar, then add an Ounce and a half of Brimstone, and work them up into two Balls with as much Sweet Oil as is sufficient, one to be taken in the Morning, and the other in the Afternoon; and all the Remedies in a Cold are also profitable and useful in this Case. Give him sometimes scalded Barley instead of Oats, and nothing will be more proper than Barley boiled in his own Water with Liquorice, which he will drink with Pleasure, after he has been used to it.

21. *For Glander'd Horses.*

Take the Roots of common Burdock sliced one Handful, of Guaiacum and Saffafrax Wood of each half a Pound, Monks Rhubarb four Ounces, Senna one Ounce, Salop bruised two Ounces, Sweet Fennel-feeds or Annifeeds one Ounce and a half, boil the Burdock Roots and the Woods in two Quarts of Water for the Space of a whole Hour: After that put in the other Ingredients, and to a Quart of the ftrained Decoction add a Quarter of a Pound of Honey; let this be given in the Morning, and let his Water alfo be warm, and fweetned with Honey.

22. *A Clyfter for the Dry-Gripes, and Pain in the Bowels.*

Take the Leaves of Mallows, Marfh-mallows, and Mercury, of each three Handfuls; boil them in three Quarts of Water for the Space of half an Hour, and ftrain it; add Lenitive Electuary four Ounces, Spirits of Wine or Brandy half a Pint, Oil or Butter half a Pound: Let thefe be infufed lukewarm into his Body: If the Horfe has had a long Time a Loofenefs and Cholick Pains, it proceeds from Wind and Phlegm. The following Clyfter may be given him as the former.

23. *Another for the fame.*

Take Red Rofe Leaves two Handfuls, Tops of Centaury the Lefs, and Wormwood of each one Handful, boil them in two Quarts of Water to three Pints, and in the Decoction diffolve two Ounces of Diafcordium, and add half a Pint of Treacle-Water or Spirits of Wine; this will take off the Pain, and lie in his Bowels like a Cordial; and in a Minute's Time will take off the violent Gripes; and in a quarter of an Hour the Horfe will rife up to feed, that before was like to dafh out his Brains againft the Wall. Purging if you pleafe.

And after that I recommend gentle Purging with fuch Things as are hot and penetrating, (and this I do contrary to the Opinion of moft Farriers) which by gentle Purging cuts and deftroys the violent Cholick Pains, and by that all the Stoppages of the Bowels are removed; and if he be bound in his Body, he muft be raked, and the former Clyfter

ster be given him; then purge him with such Things as you think proper.

24. *For the Bloody Flux.*

Bleed your Horses in the Neck Vein about a Quart, and then give such Clysters as I recommend following. Take Guaiacum half a Pound, Saffafrax four Ounces, boil them in four Quarts of Smith's Water wherein they quench their hot Irons, until one half be consumed; then cut to the strained Water Red Rose Leaves, the Tops or Leaves of Briars, and the Leaves of Brambles, of each one Handful, or instead of these, two Handfuls of Plantain; and when it has boiled a quarter of an Hour longer, take it off the Fire, and into the strained dissolve four Ounces of Diascordium, and Opium half a Dram.

25. *A Clyster of the other.*

Take a Quart of the aforesaid Water, warm it over the Fire, and dissolve in it two Ounces of Diascordium, and the like Quantity of Roch Allom; or you may put in it the Bark of an Oak Tree two Ounces, but you must boil the Water first: All Clysters that are for the Bloody-Flux must have no Oils nor greasy Ointments in them.

26. *Of Worms, Buts and Trunchions.*

These happen among all young Horses, so I recommend to you the following Clysters and Purging. Take Tanzy Flowers and Coraline, of each one Handful, Senna one Ounce, Salop in gross Powder half an Ounce; boil them in a Quart of Water, and to the strained, add two Ounces of Syrup of Buckthorn.

27. *Another Clyster.*

Take two Ounces of the Countess of *Warwick*'s Powder, and give it in Decoction wherein Rue has been boiled; let your Horse be kept from feeding two Hours before and after his Dose; give him moderate Exercise to help the Operation of the Physick, and at Night he may have scalded Bran to eat.

28. *The Purges for the same.*

Take of the best of Alloes one Ounce, Mercurius-Dulcis half an Ounce, Diagridium two Drams; make these into

a

a Ball with Liquorice Powder, or Flower, and as much Butter as is sufficient.

29. *Or this Purge.*

Take of the beft fhining Aloes one Ounce and an half, Ethiops Mineral one Ounce, Diagridium, and Diaphoretick and Antimony, of each two Drams; make them into one or two Balls, as before directed, and let them be given fafting; either of thefe being three or four times repeated, will deftroy all manner of Worms, and carry off that flimy and corruptible Matter in which they are engender'd, and without the leaft Danger: Mercurius Dulcis may be had at any of the Apothecaries; and as to the Ethiops, it is made of equal Parts of Quickfilver and Brimftone, rubbing them in a Mortar till they are incorporated, and turn to a black Powder.

30. *Clyfters for Pain in the Bowels by Accidents.*

Take two Quarts of warm Water, and diffolve in it half a Pound of Epfom Salts, and two handfuls of common Salt.

31. *Another.*

Take two Quarts of warm Water, Aloes in Powder two Ounces, Gamboge one Ounce; let thefe be ftirred into the Decoction when it is about Blood-warm, adding, at the fame time, a handful of Bay Salt, or common Salt; and, to comfort his Bowels, the Prefcribed, in the preceding Direction, to eafe violent Pains in the Bowels. This Clyfter may be given him for the dry Gripes.

32. *For the Yellows or Jaundice.*

Take Caftile Soap one Ounce, cut into Slices, and diffolve it in two or three Spoonfuls of Whey, or any other Liquid; after that, put in two Ounces of live Honey, and Powder of Turmerick, as much as will make it into two Balls; and after you have dipped them in Sweet Oil, give them to your Horfe, letting him faft two Hours before and after; this muft be repeated every other Day for a Week at leaft. But in this Cafe, the Ufe of chewing Balls, or champing green Juniper Wood, Horfe Radifh, or any fuch thing that will rouze the Spirits, muft needs be of great Service to him; and he ought to have Exercife every Day

given him that is proper for him. And if he be in Pain, he will turn his Head to his Side, and make a prancing with his Feet; in that Cafe he muft be bled, and moderately purged two or three times, if the Horfe be of a ftrong Conftitution.

33. *For the Farcin.*

This is a Diftemper that trieth the Skill of Farriers the moft of any, for it is very troublefome in all Cafes whatever, there being two or three forts of the Farcin, as the Inward and the Flying, and the Yellowifh and the Blackifh, and puts forth Buds refembling a Hen's Fundament. I will give you a few Directions concerning the fame.

34. *Begin with Purging.*

After Bleeding, moderate Purging may be complied with. Take Aloes in Powder, and Myrrh, of each one Ounce; Diaphoretick Antimony, half an Ounce; Jamaica Pepper, two Drams; make them into Balls, with a fufficient Quantity of Flour and Honey. This is fo mild, that it may be given almoft to any Horfe.

35. *Another fomewhat ftronger.*

Take Aloes two Ounces, Salt of Tartar two Drams, Gum Guaiacum and Ethiop's Mineral, of each half an Ounce; make them into Balls as the former.

Either of thefe may be given, according to the Strength of the Horfe; always obferving that he drinks nothing but white Water warmed, until the Phyfick be quite gone out of his Body; which, if he be purged three times, will be about a Week or ten Days after the firft Dofe.

36. *Another.*

Take of Rue the tender Tops and Leaves, without any of the leaft Stalks, a good Handful; firft chop them fmall, and then ftamp them in a Mortar to a very Ointment; when they are well pounded, put thereunto of the pureft white tried Hog's Greafe one Spoonful, and fo work them together to a perfect Salve or Ointment; this done, ftop into either Ear this whole Quantity by equal Portions, and put a little Wool upon the Medicine to make it keep in the better, and fo ftick up his Ears, and let him remain in the

Stable

Stab'e 24 Hours at the leaft, and then unftick his Ears and take forth the Wool, and either put him forth to Grafs, or work him moderately ; the fooner he is cured.

37. *Another.*

Take common Turpentine four Ounces, Quickfilver two Ounces, incorporate them in a Mortar until the Quickfilver is killed, and the Ointment turns to the Colour of Lead; fpread this upon Tow or Flax, and put it into the Holes of the Buds, or anoint the Knots, or wafh the Sores with Lime water, or Vitriol-water ; when they begin to die, then anoint them with Hog's-Lard and burnt Allom, but not before, left you turn the Humour back again.

When you are very fure you have killed it within, give your Horfe thofe Things that are purging and opening, and you will not fail of a Cure. But confider the horfe's Strength, and fuit his Condition. If thefe Directions, with a right Preparation of thefe Things which I have prefcribed, will not make a Cure, you had better give him to the Dogs, left he be of a Greafy Nature.

38. *For the Mange.*

You may bleed your Horfe in the Neck, but not much, then purge him. Take Sena 1 Ounce, Talapin in grofs Powder 6 Drams, Roots of fharp pointed Docks 1 handful ; flice the Roots, and boil all together in three Pints of Water to a Quart ; pafs the Decoction through a Sieve, and add to it two Ounces of Buckthorn Syrup. You may purge him two or three Times, and bleed once : In his Corn you may give him Brimftone and Liquorice together, made into Balls, one at a Time. And to anoint him, you muft put Brimftone and Hog's Lard, and burnt Allom ; or you may wafh him with old Chamber-lye and Tobacco-ftalks, with a little Oil of Turpentine ; put all together : Or you may wafh him with Vitriol-water, or Copperas-water : This will kill the Mange if not of a long ftanding : you may ufe Quickfilver and Turpentine, Hog's Lard or Butter.

Some ufe Arfenick and Quickfilver, and all other burning Remedies ; but pray take very great Care how you ufe them.

39.

39. Of *Wounds.*

I fhall here give you a few Directions concerning Wounds; if they be frefh and in the flefhy Part, they will be the fooner well. — You may drefs the Part with Honey and Turpentine, Hog's Lard, Verdigreafe, and burnt Al-lom, all melted together; and you may wafh his Wound with Vitriol-water, or Copperas-water, and any Stale or Lee that is old, heating it hot; or any Greafe or Oint-ment; or you may drefs the Wounds with Spirits of Wine, or Brandy, or Spirits of Camphire, which are very proper in all Wounds, old or new. But when they are in the Legs, or amongft the Sinews, you muft take care you do not hurt the Sinews: You muft not ufe any cauftick Medicines, as Arfenick, or Mercury, Vitriol, or Quickfilver, for thofe Things are very injurious in thofe Parts. But if they be in the flefhy Parts, you may ufe thofe Things, if there be Oc-cafion, to take down the proud Flefh, and clean the Wound; then heal up the Sore with thofe Things above-mentioned; but if the Wound be torn very deep, you muft ftitch up the wounded Part with two Stitches juft in the middle, and if there be a great deal of Blood, you may ftop the Wound full of Salt, or you may put in Lint dipt in Vitriol-water, and in three or four Days you may cut the Stitches and clean the Wound; but you muft drefs the Wound the next Day with fome mild Ointments, fuch as are proper for any new Wounds.—You may ufe Mutton Suet, Hog's Lard, or com-mon Turpentine, or Honey, or any Spirits you may wafh the Wound with, as before mention'd.

40. *Concerning Ulcers, or hard Swellings.*

If a Wound be turn'd to a ftinking Matter, that is, a great Running, and full of rotten Flefh, full of Holes, it is faid to be an Ulcer; and when it is fo very bad, to begin the Cure you muft clean the Wound with Mutton Suet boiling hot, and fearch for the Bottom of the Wound; and when you have found out the Caufe of the Thing, you will know the better how to go on.

The next Thing to be done is, you muft put in Vitriol-ftone, or Arfenick, or Mercury; put fome into every Hole, as much as you think proper to bring out the Core, and in forty-eight Hours you will find the Core to be loofe, and then you muft put in a little burnt Allom and Verdigreafe, or a little Vitriol; and when the Core is quite out, and the

<div align="right">Wound</div>

Wound well cleaned, you muſt be ſure to waſh it well with ſome Spirits of any Sort, and then you may anoint the Wound with Honey or Hog's Lard, or Turpentine ; or you may anoint it with Ointment of Tobacco, or any other greaſy Ointments ; but if the proud Fleſh riſes up, you muſt touch it with a hot Iron, but very gently ; but pray take care you do not touch the Sinews or Veins, if you can any ways help it ; aud if you do, pour in Ointment with Sweet-oil and Soap, to take the Fire out, and then go on as before-mention'd ; and you muſt purge him and bleed him, and put a R wel into his Belly, and keep his Body open with opening Things, if his Strength will bear it, and then you need not fear a Cure with Care.

41. *Of Swellings new or old.*

As concerning Swellings, whether new or old, or of a long ſtanding ; which if they be new, anoint them with Brandy, or Spirits of Wine, or Camphire, the Oil of Worms, or Swallows, or Oil of Turpentine, and be ſure you have a good large hot Iron to keep in the Heat, there being no-thing better than a Salamander, or a Bar of Iron that is thick, to keep in the Heat : And be ſure you work in Oils or Ointments with your Hands, and a hot Iron, and that will ſink the Swelling, and bring it to a Head ; and you muſt feel with your Finger if it be ripe, and if it comes to a Head, and does not break of itſelf, you muſt take a little hot Iron, about the bigneſs of your Finger, and if you can come at the Bottom where it is ripe, you may burn a Hole about two Inches deep, and then the Anguiſh will come out ; but if you cannot burn it, you muſt open it with a Lancet, and when it is opened, you muſt waſh it with Things that are proper, very hot, to heal the Wound, that you come to the Bottom of it, and then you muſt go on as in the Manner before mentioned ; for then it is become an Ulcer, and you muſt uſe ſome cauſtick Remedy, which is Arſenick, or Vitriol, or Mercury, or burnt Allom ; and when the Core comes out, ſearch it well, and be ſure you are at the Bottom of the Wound. You may waſh it with Vinegar, or Vitriol-water, or Copperas-water, and then if it be clean, you muſt anoint it with greaſy Ointments, and waſh it with any Spirits or Brandy, to comfort the wounded Part, and I hope you will not fail of obtaining a Cure.

Take

Take care that the Horse does not catch Cold, and if you are afraid of a Mortification, you must make a Fermentation to bathe the wounded Part twice a Day, Morning and Evening, and make it with Emptyings of strong Ale, or Lees of Wine, about two Gallons of Liquor, and then put in a handful of Hemlocks, and a handful of Mallows, Plantain, and Burdocks, Adders Tongues, and Adders Leaves, and Leaves of Horse-radish, or any stinking Weeds that can be had; you may put a Pint of Spirits of Wine in it after it has boil'd an Hour or longer. — All these Things are to be had in the Summer; take a handful of each, and when you dress the Wound, you may lay on some of the Herbs when they are hot, which is very proper.

And when you have so done, you may pour in some Mutton-suet melted into the Wound, and then anoint it with Honey and Turpentine, and Ointment of Tobacco, and a little Tar: You may put it into a little burnt Allom, or take the Sole of an old Shoe, and burn it to Powder, and put into it, which is very proper to clean any Wound, and will heal up any Sore.

But if you have this Misfortune in Winter, you must make your Fermentation of the same Liquids, but instead of those Herbs, you must put in one handful of Rue, one handful of Mint, and a handful of Thyme, a Pint of camphorated Spirits of Wine, or a Pint of Brandy, and half a Pint of Sweet-oil; and when you find that the Mortification is stopt, you may heal the Wound with those Remedies of Ointments and Spirits before-mentioned, concerning *Wounds* and *Ulcers.*

And I hope, with Care, these Remedies will effect the Cure, if it has not taken the Brain. — If the Horse be old, and poor in Flesh, so that he is not able to go through his Cure, in that Case, you must give him two or three Doses of Physick, and a Rowel or two, and you must purge him with those before mentioned, concerning Physick.

I have now given you some useful Directions concerning Wounds and Ulcers, the nearest and safest Way that can be done without cutting, or thrusting in long Tents, which by cutting and burning, many a poor Farrier has spoiled many a good Horse for want of Judgment.

There are a great many more Remedies of this Kind, for Wounds and Ulcers, without cutting or burning, which I have omitted. I have just put down a few of the safest

Re-

Remedies as can be done in this Kind. —— Which with
Care, they will. I hope, anfwer your Expectation, I will
now give you fome proper Directions in the preceeding
Rule, concerning the Biting of *venomous Beajts*, as the *Biting*
of a mad Dog, or *Adder*, &c.

42. *Of the Biting of venomous Beafts.*

There are infinite Ways of curing thofe Bites, fome give
Fire, and fome cut out the Bite that is wounded ; but thefe
Operations cannot be allowed of in all Parts ; but chiefly
when the Wound is made in the Flefh. and free from the
Nerves and Sinews : others only apply Garlick, Onions,
Bay-falt, and Bacon ftamped together into an Ointment;
others ftamp Rue, Muftard-Seed, pickled Herrings, and
b'ack Soap, with a fufficient Quantity of Deers Suet, or
Bears Greafe.

As for the *Biting of an Adder*, there is nothing better
than Adder's Fat to anoint the Wound with, or Greafe,
which you may always keep in a Readinefs in a Gallipot,
the Certainty of which has been experienced (and made
Cures) by a great many eminent Phyficians : you may
anoint with fweet Oil and Plantain, which are very proper.
I fhall next fet down two or three Remedies concerning
Cauterizing and giving the Fire.

43. *Cauterizing and giving the Fire.*

This is performed by an Inftrument made hot ; or by cor-
rofive and burning Medicines, which is to keep down a
Growth of fungous Flefh, to eat away and deftroy it, and
moreover to ftop up the Mouths of Blood; a Veffel thereby
to prevent an Hemorrhage of Blood ; and when fo done, go
on with your Cure ; but be fure you make your Orifice at
the bottom of your Wound, and then put in little Soap
Tents of Flax dipped in warm Bafilicon, or any other Oint-
ments, and all the feared and burnt Parts ought to be im-
mediately bathed with Spirits of Wine, and afterwards a-
nointed with a Mixture of Bees-wax and Oil melted toge-
ther, or with common Tar, until the Scars fall off ; but if
there be a very great Heat and Anguifh, and a Tendency
to a Swelling in the Legs, efpecially of thofe Horfes that
are tender and wafhy in that Cafe, camphorated Spirit of
Wine may be ufed two or three Times a Day, or Recourfe
may be had to Fomentations and Baths, or attenuating Oils,
fuch

fuch as the Oil of Earth-worms, or the Soldiers Ointment; for by thefe means the Grievance and the Burn comes fooner to a Separation, and you may heal up the Wound with any greafy Ointment above-mentioned, but you muft take care you don't heat your Irons too hot, a Charcoal Fire is the propereft for it, and when you take it off the Fire, rub it with a Woollen Cloth, for fear of any Dirt or Sand, and 'tis proper to have your Iron according to your Place, if it be in the Legs, a flat one is beft, and you muft draw your Strokes along with the Hair, but take care you do not touch the Sinews for fear of a Fever, and you muft burn the Skin the Colour of a Cherry, but not deep ; but if the Grievance happens in the Flefh, you may ufe a round Iron or a fquare one, and make your Orifice as proper as you can to difcharge the Humours; and you muft bathe the Wound with Spirits and greafy Ointments, and when you have brought it to a frefh Wound, you muft heal it with Tar and Honey, Hog's Lard and Turpentine, and a little burnt Allom, which I hope will anfwer your End.

44. *Of Rowelling.*

Rowelling is an artificial Vent made to difcharge the Humours, and to drain any ill Humours from any Swelling, or any Wound, or a Strain, or Humours in the Eyes, or in any Part of the Body ; Rowelling is very proper in all thefe Cafes ; if your Horfe's Eyes be bad, you muft rowel him in the Head under his Throat, which is very proper ; and if his Legs fwell and run, you muft rowel him in the Belly ; or when the Swellings and Wounds happen in any other Part, you muft put in your Rowel as near as you can.; you muft make your Orifice in a flefhy Part as much as poffible, becaufe you may raife the Skin for your Rowel, and the better for the Humours to drain off, and to put in the Rowel ; but you muft take care you don't cut too deep, for there are two Skins, and you muft put the Rowel between them ; and after that, fill the Hole with Turpentine and Hog's Lard, and take care you don't cut any Veins or Sinews.

There are two Sorts of Rowels, a Hair Rowel, and a *Erench* Rowel ; and I think the *French* Rowel is the beft. Horfes that are poor, and hide-bound, and confumptive, Rowelling does them harm ; and fo much for Rowelling.

45. *For Gelding young Colts or Horses,*

The Gelding of a Foal is an eafy Operation, and feldom is attended with any ill Accidents, if the Gelder be Mafter of his Bufinefs ; but in an old Horfe there are fome trouble-fome Cafes, becaufe they being in Years, their Strength and Vigour decreafes, or the Company of Mares may have over-ftrained them, or a Bruife in their Bowels by any Ac-cident that may befal them, as thofe of nine or ten Years of Age ; then fometimes thofe Horfes are in great Danger by Gelding.

If they have any of thofe Accidents, the Gelder muft take great care that he does take up all the Strings of his Stones, and fear them with a well polifh'd Iron, and rub it very well on a Woollen Cloth, for Fear any Sparks or Dirt fhould come off ; then if any Accidents happen that Way, it is apt to create a Fever in the Bowels, or a great Swelling in his Sheath, and be fure you bathe the Part with Spirits of Wine or Camphire, or Brandy ; if he fhould fwell very much, make a Poultife with Cow-Dung and Hog's Lard, or Oatmeal and Milk, and Hog's Lard, and you muft make him a Trufs of Flannel or Bays ; cut it Three-fquare, and put on three Strings of Tape or Lifts, one of the Strings muft go between his Legs, and the other two go up between each Side of his Flanks, and tie upon his Back all three Strings together, and you may anoint him with Marfh-mallows, and keep the Holes open with Hog's Lard, and keep him with opening Diet and moderate Exercife.

As for a Colt, there is no great Danger in them, when they are fo young, if you keep the Holes open, and keep him from taking Cold ; you may give him Barley-water to drink for two or three Days, and rowel him in his Hind Legs, or in his Belly, and if you are afraid of a Mortifica-tion, bathe him with a Fermentation, fuch as is prefcribed in Page 354. N°. 41. *concerning Ulcers*. Now I have given you a true Account concerning gelding, and Remedies for the fame.

46. *For Docking of Horfes,* &c.

All that I intend to fay upon this Subject, is to defire you not to fear your Horfes too much when you dock them, becaufe the Fire very often gets into his Back, and kills him, efpecially when he is dock'd too fhort, and a choice Horfe ; but as for Mares, the Rule for them is to cover their Por-
dens ;

dens ; and as for a Nag, what you may call a Hunter, to
be as long as a Mare's, or longer, which is about seven or
eight Inches long ; and after he is well, you may nick him,
and then he will have a fine Tail, and set it very well, if
he be nick'd as he should ; pray let your Irons be heated in
a Charcoal Fire, not red hot, and well-polished Iron, and
very well rubbed, as before-mentioned.

47. *For the Lampers.*

The Lampers is a bad Thing, and very troublesome to
Horses when they are young. It is a hard Swelling in the
Mouth, which makes it very troublesome for them to feed,
and it is cured by applying a hot Iron, made for that pur-
pose, and you must burn it, but not too deep, but even with
the Roof of the Mouth, and rub it well with Salt, and give
him scalded Bran, or raw Malt to eat, and he will soon be
well.

48. *For Bladders, and other Diseases in the Mouth of Horses.*

The Mouth of a Horse is subject to several Infirmities,
and cannot be easily removed without the Fire, or some cor-
rosive Medicine. There is the Gigs, which some call the
Flaps ; and as for Bladders, they, for the most Part, grow
on the Inside of the Lips, and sometimes towards the Pa-
late ; but for those on the Lips, the usual Method of Cure
is, by slitting them open, and discharging the Matter out of
them, and afterwards washing them with Salt and Vinegar.
The Gigs are cured by clipping them off with yours Scissars,
or a Knife, and rub them with Salt ; those of the Lips are
caused by some rusty Bit, or by feeding near the Ground,
or Pricks of the Bushes in the Spring Time, which makes
their Lips to swell, and very often it turns to Cankers ; and
to cure this, is to wash with Vitriol-water, or Copperas-
water, or Lime and burnt Allom ; put these into a Quart of
boiling Water, and make it as you think proper ; and you
may bleed your Horse's Mouth with any of these Waters,
which is very proper in all these Cases, concerning the Gigs
and Bladders, or the Cankers, or of any Distemper in the
Head ; or you may anoint your Horse with Ointments that
will kill and dry the Humours ; Tar is very proper, and
burnt Allom, or a little slack'd Lime is very good for it,
or sweet Oil and the Juice of Plantain ; and keep them in
the Stable for a Week or more, and I hope you will not
fail of a Cure.

49.

49. *For the Pole-Evil, or a Fistula.*

The Pole-Evil is an Imposthume which arises on the Pole, and for the most Part is caused by a Blow or a Pinch, or the fretting of a new Halter or Collar, and at first it requires no other Method of Cure than what is common to other Boils and inflam'd Tumours, by ripening and bringing it to Matter ; but when it is of an old standing, then it oftentimes turns to an Ulcer for want of Care, or a right Judgment. There is a small Sinew under the Knowl-bone, where the Matter is apt to lodge, unless Care be taken, and when it is ripe and ready to break, you must open it with a Lancet, or Knife, for when it is open, you may come at it the better, and when you burn it with your Iron, you must put in a Tent ; but I think Tents are not so proper for any Wounds, if it can be any way helped ; for when they tent any Wound, it is all Guess-work, you may be wrong as well as right.

But it is my Opinion, that it is the best way to lay them open, the better to come at the Bottom of the Wound ; then cleanse the Ulcer with any Caustick Remedies, or Spirits of Wine, or Brandy, or Spirits of Camphire, or Mutton-suet melted, or Vitriol, or Mercury, or Arsenick, or any thing that's proper to eat away the proud Flesh, and when you have gotten to the Bottom, and quite cleaned it, then you may heal up the Wound with any greasy Ointments, as before-mentioned, concerning Wounds and Ulcers.

A Fistula is a Thing that comes by a Pinch of a Saddle upon the Pitch of the Shoulder, and you must go on as before-mentioned ; you must bathe the Swelling first, and sink it if you can, and when you have brought it to a Head, go on as before, and I don't doubt, but with Care you will find all these Things will answer your End, for the Cures concerning Wounds and Fistula's, Pole-Evils and Ulcers.

50. *For Navel Galls.*

A Navel Gall is seated upon the Top of the Back, opposite to the Navel, and it is caused by a bad Saddle, which being neglected, turns to a foul, fungous and a Fistula-Ulcer, and sometimes it looks like a hard dented brown Jelly, and sometimes black and mortified, and sometimes white and Moisture in the Part. ———— An Ointment may be made of Quick-silver and Turpentine, one Ounce of Quick-silver

filver to every two Ounces of Turpentine, rub them in a Mortar 'till they be well incorporated, and then spread upon Hurds or Flax, and laid smooth on each Side of the Spine over the Swelling, and dry Pledgits of Hurds or Bolsters to keep it on, and then girt him round with a Circingle. But if the Sore be dead, and full of proud Flesh, you must cut it to the Quick with a sharp Knife, or Razor, and then let it be dressed according to the Directions given in the Cure of Wounds.

A Sitfast also proceeds from a Saddle-Gall, and when it is dry and horny, it may be cured by anointing it first with Oil of Bays until it turns soft, and then by dressing it with Quickfilver and Turpentine, as before directed, which alone will make a Cure, when you have got all the horny Substance off from the Wounds. I think I have given you sufficient Directions concerning Navel-Galls or Sitfasts, so that any Smith or Farmer may make a Cure, if he knows any thing of a Horse at all.

51. *For a* Wrench *in the* Shoulder, *or a* Shoulder-Splint.

To understand the Nature of these Infirmities, that is, to remember that the Blade-bone of the Shoulder is fixed to the Body, not by Articulation or Jointing, but by Appofition, being laid to the Ribs, and fastened by the Muscles, which lie under and above it; so when a Horse happens to receive a Blow, or a Strain in the Shoulder, the Tendons of those Muscles are stretched and relaxed, and when that is violent, it is called a Shoulder-splint, and becomes more or less dangerous, according as the Horse is for Hardiness. And this Accident happens to him sometimes by a false Step, or a Blow, or hard Riding; and to find out where the Distemper lies, you must try him by shoeing him and searching him from his Shoulder to the Bottom of his Foot, and you must press your Hand hard against his Shoulder; and if he be hurt there, he will flinch when you touch the wounded Part, and will draw his Legs with a Circuit like Half-Moon, and so you must go down to his Knee, and if you find it there, his Knee will be swelled, and burn with heat like a Fire, and will not bend it.—And from thence go down to his Pastern Joints, and if he be strained in the Sinews, they will puff out and swell like a Bladder. And sometimes it is in the Joint, then he will go on his two Legs. But when it is in the Foot, you will soon find it

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out, by setting it to the Ground, and when he treads upon the Ground, he will favour himself, and take his Foot up again, and when he does that, you may well know where his Ailment is. I hope I have given you such Directions as that you may easily find out the Cause; and now to proceed to the Cure.

If it be in the Shoulder, take Oil of Turpentine, and the Oil of Worms, and Brandy, and camphorated Spirits and Spirits of Wine, of each an Ounce, and burn him with a hot Iron. Take of the Sold er's Ointment, or Nerve Ointment, half a Pound, Ointment of Marsh-mallows six Ounces, Oil of Amber four Ounces; mix them all together, and with a hot Iron Bar chafe the Part twice a Day.

The Soldier's Ointment is made as follows. Take fresh Bay-leaves half a Pound, of Rue five Ounces, of Marjoram foor Ounces, two Ounces of Mint, of Sage, Wormwood Comfrey and Basil, of each an Ounce, Oil Olive three Pounds four Ounces, of yellow Wax eight Ounces, of Malaga Wine four Ounces; bruise all these together, and boil them to the Confistence of an Ointment, so keep it close or the Ointment of *Montpellier,* which is made as follows:

Take of Ointment of Roses, Marsh-mallows, Populeon and Honey, of each one Ounce; as likewise of the Oil of Turpentine, Earth-worms, and Oil of Petre; Nerve Oil Bear's Grease, Hog's Grease, Mule's Grease, Deer's Suet and Badger's Grease, the same Quantity of each, so melt them together: all these Oils are very proper for any Strain or Bruises as before mentioned. But if a Shoulder be split which may happen by a Blow, or a Kick of another Horse, and these Oils or Ointments may not answer the End, which will be seen in two or three Days, you may be assured there is some great Accident, and you must fire him round the Plate-bone, making a Circle the Breadth of a Trencher, but be sure to let the Joint be in the middle within the Circle, and pierce the Skin with a small hot Iron, leaving about an Inch between the Holes; and to each Hole apply yellow Wax and Rosin, melted together, untill the Scars fall out, and then dress with Turpentine and Honey, applying Plaisters, as directed, untill the Sores be dried up, which are made as follows:

Take common Pitch half a Pound, Deminio Plaister, of Diachylon, of either six Ounces, of common Turpentine feur Qunces, of Oil-olive two Ounces; melt them together

in a Pipkin over hot Embers, continuing ftirring; and when thefe are diffolved, add Bole Armoniack, in fine Powder, four Ounces; Myrrh and Aloes, of each an Ounce; fpread this on the Horfe's Shoulder before it grows cold, and put fine Flokes, of the Colour of the Horfe, all over it; for a Shou'der-Pitch is caufed by a Fall, &c. which will be feen by a Swelling on the Pitch of the Shoulders. The beft way is to bleed him in the Plate-Vein, and put a Rowel in his Cheft, and you may bathe him with the afore-mentioned Oils; and when the Rowels begin to run, give him moderate Exercife every Day, and that will carry it off, unlefs he be very much bruifed; and if fo, you muft bathe him with the Fermentation before-mentioned concerning Wounds; which, if he don't take Cold, will anfwer the End.

52. *For Swayed Backs, and Strains of the Hips.*

A Swaying of the Back is a Pain and Weaknefs in the Reins, caufed by a Fall, or the carrying of fome heavy Burden, and the Horfe is Hurt very much inwardly, which brings him into the greateft Diforder imaginable. There is no fuch Thing as to break a Horfe's Back but by an Accident, as a Fall, or carrying fome heavy Burthen, and then you ftrain the Sinews and the Mufcles of the Back; and to begin the Cure, the firft Thing is, to take a plentiful deal of Blood from the Neck, after that a cold Charge, which is Vinegar, Bole Armoniack, and the Whites of Eggs, Verjuice may be ufed inftead of Vinegar, and you may give him fweet Oil a quarter of a Pint in a Day, for two or three Days together; and if the Horfe be not poor, you may bleed him behind in the Thigh Veins, and you may give him Brimftone and Powder of Liquorice, and Honey, with fome fweet Oil, made into Balls; give him one at Night, and one in the Morning; and you muft give him a good deal of Reft, and if it be in the Spring of the Year, turn him out to Grafs, and if he be a young Horfe, he will do well the fooner, for Reft is the cheif Article of the Cure.

But if it be a Mare, fhe will do well the fooner, for fhe will throw out the Clods of Blood from her Body, and if they be weak, you may girt them round with a Circingle, and you may put a Sheep's-fkin on the Back, and that will be of great Service to them.—The Strains of the Hips are to be accounted for, in the fame Manner as thofe of the

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Shoulders, and if the Thigh-bone be thruſt out of its Socket by the Violence of the Accident, then it is ſaid to be Hip-ſhot, and if it is not reduced immediately, he will be irreco-verably lame. The Cure conſiſts in the ſame Applications that are proper for a Shoulder-ſplint.

53. *For Hurts in the Stiſles.*

This kind of Accident comes by a Strain, or a Blow on the Stiſle-bone, which is the Knee-pan of a Horſe; when the Li-gaments which cover that Bone are ſo much relaxed, that it becomes looſe, moving upwards and downwards, and ſide-ways by the Touch of your Hand, and the Horſe going down-right lame, he is ſaid to be ſtiſled; but it is a great Miſtake in ſome People, to think the Bone is out of Joint, for there is no ſuch thing can be, except thoſe Ligaments are cut aſunder; for when the Horſe has a Blow on thoſe Ligaments, then he goes very lame, and he is ſaid to be ſtiſled. And now I will proceed to the Cure.

Firſt, anoint him with Marſh-mallows, or Oil of Turpen-tine, doing it in with a hot Iron, and you may numb his other Leg with the Web of a Girt, and in two or three Days you may lay on the Plaiſter, which muſt be made of Pitch, Myrrh, Olibanum, and Dragon's-blood; the Pitch muſt be melted with a little Oil, or Hog's Lard, and the other Ingredients made into Powder, and ſtirred into it while it is warm, and after that it may be poured upon the ſtiſling Place, covering it with Flokes, or the Stuffing of an old Saddle, and you may put him to Graſs an Hour or two in a Day, and give him mo-derate Exerciſe, until he is fit for more hard Labour.

54. *For the Bone-Spavin.*

This is a hard bony Subſtance that grows on the Inſide of the Hoof, not far from the Elbow, and is generated of the Matter which nouriſhes the Bones and Ligaments. Some Horſes are foaled with this Imperfection, but for the moſt part it proceeds from a Stain, while a Horſe is too young to bear violent Fatigue, which in Proceſs of Time cauſes Lameneſs. The main Intention in the Cure, is to remove the Excreſcence, for it lies as an Appendage; in which Caſe it may be removed by a dexterous Application of the Fire, or by the Uſe of cauſtick Ointments; for theſe, by bringing a Flux of Matter, and a conſtant Moiſture into the

the Part, will by degrees loosen that hard Substance, so that it may be easily taken off; and for this Purpose I recommend to you the following Ingredients:

Take Quickfilver and Brimstone, of each two Ounces, rub them in a Mortar until they turn to a black Powder; then take *Spanish* Flies, and Euphorbium in Powder, of each six Drams, corrosive Sublimate two Drams, Apostle's Ointment four Ounces; mix them cold in a Mortar, or on a Marble. The Method of applying this Ointment is, first, rub the Part with a Piece of any round smooth Stick, then lay over a sticking Plaister to guard the rest of the Hoof; this must be made of Rosin, common Pitch, or *Burgundy* Pitch, spread on a thick Piece of Leather, having a Hole cut in the Middle that the Tumour may come through it, upon which the Ointment is to be applied, the Hair being also shaved away, over which must be laid a Pledgit of clean Hurds, fastened with an easy Bandage round the Hoof, or another sticking Plaister over.

This Ointment will at first draw out a thin Water, but after two or three Days Application it will form a Scar, which may be scarrified with a Flem or Lancet, continuing the Application every other Day, until the Bone becomes loose, or its Substance dissolves; and after it is removed, the Ulcer must be dressed with Honey of Roses, and Tincture of Myrrh warm.

55. *For the Blood Spavin.*

This Distemper comes by a Swelling of the Master-vein on the Inside of the Hoof, and is justly compared by *Solley-fell* to an *Avarix* in Men, and the Cure is performed by taking up that Part of the Vein which forms the Tumour, and healing the Wound by binding the Hoof at top and below with a strong Bandage, and then tie the Vein with a Bit of Silk at both Ends before you cut the Vein in two, because the great Quantity of Blood that will come therefrom, will make it very troublesome to tie the Vein when it is cut; when this is done, heal up the Wound with Honey and Turpentine, and a little Tar, and wash the Wound with Brandy, or Spirits of Wine.

Some Farriers only prick the Vein with a Flem or a Lancet, and tie a strong Bandage over the Orifice, and so apply a cold Charge all round the Joint, made with Whites of Eggs, Bole Armoniack, and Vinegar; but it is not a

certain

certain Cure, for the Way is to take up the Vein (as I said before) and a Cold Charge is very proper in this Case if the Vein be took up, because it will strengthen the Joint after you have healed up the Wound.

56. *For Mallenders and Selkenders.*

The Mallenders are Chops or Chinks on the bending of the Knee, which discharge a sharp undigested Matter causing Pain, and making the Horse go lame before. And the Sellenders, which appear on the bending of the Hoof, makes him go lame behind ; both which proceed from one and the same Cause, and are sometimes accompanied with a Scab, and a constant staring and bristling of the Hair.

The properest Method for the Cure is, first wash them with a Lather of black Soap warm, or old Chamberlye, after which, apply a Poultise of the Roots of Marsh-mallows and Linseeds, softened with Linseed-oil ; and as often as it is applied, you may mix half an Ounce of Camphire in Powder, tying it on with a Roller ; this may be continued till the Scabs fall off, and the Sores grow clean ; then take Turpentine and Quicksilver, of each equal Parts, stirring them in a Mortar till they be well incorporated spread a Pledgit with the Ointment, and apply it to the Sore, laying it on as above directed, and renew the Dressing every Day until the Cure is perfected, observing constantly to wash all the Chinks with Brandy, or Spirits of Wine.

You may put on a little Oil of Vitriol, and a little Juice of Elder, and anoint them with a Feather once a Day, for two or three Days together when they come first, and when the Scabs fall off, anoint with Hog's-lard and Soot, which will make the Hair come again ; or a Turd is very good when they come first.

57. *For the Hock Bony.*

This is a hard Tumour that grows on the Elbow of the Hock, and is Sinew like the Matter which covers that Bone ; it proceeds from a Strain or a Blow, and when it happens to be of long Continuance, it becomes difficult and hard to be cured, the Substance of the Swelling being like hardened Glue —In the Beginning take Soldier's Ointment, Ointment of Marsh-mallows, and Oil of Amber, as directed in Page 361. No. 51. against *Strains in the Shoulders*, and rub it into the Part with a hot Bar of Iron, holding it

close

ciose and taking care to fetter the Horſe ſo as he cannot ſtrike.

If it does not yield to this Remedy, take a ſufficient Quantity of a Diachylon with the Gums, which may be had at any Apothecary's, melt it in a Pipkin, and pour it warm upon the Top of the Hoof, renewing it as often as it begins to waſte; if the Swelling increaſes, and turns to an Impoſthume, it may be ripened with a Poultiſe, and opened with a hot Iron, piercing from below upwards, and dreſſed with the common Ointment, *viz.* Turpentine and Honey, or the Yolks of Eggs, with a Mixture of Spirits of Wine, making a firm Bandage over the Part, and by this Means it may be cured. But if the Hardneſs ſhould happen to continue, and cannot be brought to a Head, then proceed to the Fire. Firſt, make a little Way into the Body of the Tumour with a round Iron, and drawing from thence ſeveral ſuperficial Lines, which may be dreſſed according to the Method already laid down for performing that Operation.

58. *For a Splint or Splints.*

A *Splint* is a callous hard Subſtance that adheres to the Inſide of the Shank-bone; when there is but one, is it called a *Single Splint*, but when there is another oppoſite to it, on the Out-ſide of the Shank-bone, it is called a *Pege,* or *Pined Splint*; they proceed from a Strain, or by being preſſed with ſome extraordinary Weight towards the Shoulders, before thoſe Bones are firmly cemented and put together, eſpecially when he goes down Hill with a heavy Burthen on his Back, it bears ſo hard upon his Fore-legs, which cauſes thoſe little Bones which ſupport the Knee to bend; and although the Horſe does not grow immediately lame upon it, yet it brings a glutinous Matter which ouzes from between the Bones on the Inſide of the Shank, and it is like the Gum which iſſues from a wounded Tree, and is thus formed into a Splint. But when it is violent, or the Horſe be of a tender delicate Make, the Influx of Matter will be the greater, ſo that it ouzes through the oppoſite Side alſo, and forms a *Peged,* or *thorough Splint,* which looks as if a Wedge was ſtruck quite through the Bone.

Moſt of theſe Swellings make their firſt Appearance a pretty way below the Knee, in the Cleft between the Bones in the wideſt Part, which is very natural; they not only

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afcend to the Knee, but go a good way down the Shank, but fometimes backwards towards the Mafter-finew; there are little hard Subftances that arife among the fmall Bones of the Knee, on the Infide ; they grow out of the gummy Subftance that faftens thofe Bones together, one on the Out-fide, and the other on the Infide, and that is what are called *Splints* ; but when there is but one, it is then called a *fingle Splint*. And when it is of a long Continuance, it turns to a hard Subftance like a Spavin, or the Bone itfelf.——And to deftroy this hard Subftance, the Cure is this : If the Horfe be young, and the Splint tender, you may rub it with a Stick, and after you have bruifed it till it is turned foft, ftrike your Flem or Lancet into it, but be fure you don't cut too deep, for fear of cutting the Sinews.

Then fhaving the Hair away, anoint it with the Ointment before mentioned ; then lay on a Bliftering Plaifter to draw out that gummy Subftance ; but if it is become a hard Subftance, you muft knock and rub it to foften the Splint ; then take a Piece of the Rind of Bacon, not very fat, and lay the fat Side outwards ; afterwards apply a flat Cautery, or a red hot Iron, about the Bignefs of a Shilling, holding it upon his Skin ; in the mean time, order another Iron to be heated; which muft be applied after the fame manner, till the Swel-ling be funk.

Then lay a Plaifter over it, and the Shavings of Cloth upon that ; take care that the Horfe do not bite it off. But if the Horfe is growing old, and the Splint is become a bony Sub-ftance, and is very faft to the Bone, then it is very hard to be cured ; but if the Horfe be young, and the Splints be only a gummy Subftance, then you may make a Cure.

59. *For a Sinew-fprain.*

A *Sinew-fprain* comes by a fudden Accident, and 'tis very common among Horfes, fo that no Man can be a Stranger to it that keeps Horfes, for the Sinew will fwell, and the Horfe will be lame, and in that Part there will be a great Heat and Swelling. — Then bleed him in the Neck, and bathe all his Legs two or three times a Day, with Woollen Cloths wrung out of a Fomentation made of Mint, Rue, Penniroyal, Marjoram, Baum, Rofemary, Lavender, and fuch like Things, to comfort the Nerves ; after that you may ufe Spirits of Wine, keeping it alfo covered with a Cloth dipt in the fame, and faftened with any Bandage till

the

the Anguish is over; then lay on a good strengthening Charge, or Plaister of *Burgundy* Pitch, Diachylon, Dragon's-blood, and Bole Armoniack; and if the Horse is galled or wounded, take Tar, Turpentine, and Honey, to heal up the Sore.

60. *To make green Oil, or Oil of Charity.*

Take the Tops of young Bays, Red Sage, Lavender Tops, and Rosemary, of each a Handful, Camomile a Handful and a half, shred them very fine, and pound them in a Mortar; then put a Quart of the best Sallad-Oil to them, then put all of them into a new glaz'd Pipkin, cover it close, and set it on a gentle Fire, that it may not boil, but only simmer. The Lid of the Pipkin must have a Hole in the Top for the Vapour to evaporate; keep it an Hour and half, then strain it through a clean Cloth, into a clean Bottle, and when it is cold, put in an Ounce of the Oil of Spike. It is only to be made in *May*, and is very good for a Burn or Strain, or any old or new Wound, or Pains in the Body, warm or cold.

61. *For a Ring-Bone.*

This is a hard callous Substance, that grows in the hollow Circle of the little Pastern above the Cronet, and is frequently occasioned by a Strain, and is bred of the like Matter with the other hard Substances before mentioned concerning *Splints*, and breaks out upon the Top of his Foot, and goes quite round like a Ring; from that it has obtained the Name of a *Ring-bone*.

The useful Method of taking it off, is by applying strong caustick Medicines, such as Quickfilver, Arsenick, Realgar, and the like. The Hair being first shaved, and the hard Substance scarrified, some use unslacked Lime in Powder, and apply it pretty thick over the Part, fastening it with a Cloth, and then ride the Horse into the Water, letting him stand some time in it, by which Means the Ring-bone is destroyed. But whoever tries it, had need be very careful to guard the Cronet, or else it will be apt to cause a Gathering of Matter under the Hoof, which would readily corrode the Coffin-bone.

There are others who cut the Ring-bone strait downwards to the Cronet in several Places, and put in Rowels, which by forming Ulcers, and bringing a Rottenness and Corrup-

tion

tion all about the Part, loofens and melts it away. But fome Ring bones cannot be removed without the Fire, and the Soles taken out, and the Frufh laid open ; for by this there is a very great Moifture derived into the Part, and at the fame Time, Room is given for the Matter to difcharge itfelf ; but if the Horfe be old, and the Ring-bone of a long Standing, it will be a hard Thing to cure him.

62. *For Wind-Galls.*

Wind galls are foft Tumours feated on either Side of the Footlock Joint ; they are caufed by violent Straining, or any Blows by another Horfe ; and the Cure is performed by opening them with a Flem to let out the gummy Matter, and applying to the Orifice a little Plaifter of Rofin, Pitch, Maftick, Oil of Bays, with the White of an Egg, and the Ointment made of equal Parts ; Oil of Turpentine and Quickfilver will anfwer the End much better.— But the hollow Space on each Side of the Sinew mufl be filled with Hurds moiftened in warm Spirits of Wine, and a good Bandage applied over all the Fetlock, to prevent their growing again ; or the following Charge may be apply'd.—Take two Ounces of Galbanum pounded, boil it gently in a Pint of Vinegar over hot Embers, with half a Pound of common Turpentine, and after half an Hour's Boiling take it off the Fire, and add to it Maftick, Myrrh, Dragon's-Blood, and Bole-armoniack, of each three Ounces ; mix thefe and make a Charge, which muft be applied hot to his Legs, and if the Horfe be not old, nor much ftrained, thefe Remedies will not fail of a Cure.

63. *For the Greafe falling into the Legs.*

This Diftemper is a Swelling and a Gourdinefs of the Legs, which frequently happening to Horfes after a Journey, moft People have therefore believed their Greafe to be melted with hard Riding, and fo falls into their Legs ; but the Greafe is frequently known by moft Men that keep Horfes ; and this Diftemper happens by bad Feeding, or long ftanding in a Stable, for Want of Exercife, or by hard Labour ; for when you feed your Horfe well, and make h... .u.ty, then if you work him hard, and let him ftand ftill in the Stable, that is the Caufe of his Legs fwelling all round the Joint, and his Legs will drop like a Leach, and then they fay his Greafe is melted, becaufe he looks thin

and

and won't eat his Meat ; but that is not the Thing, for he is in great Pain, and will not eat his Meat by Reason of the Anguish he is in ; for when a Horse's Grease is melted, he will never be fit for any more Business, for then it is said that his Heart is broke.—For take all the Pains you can, it's all in vain, for he'll waste away like a consumptive Man, and die as rotten as a Pear ; and some of these Humours happen to be Heart-swoonings, and his Legs are hot and dry, and break out in the Footlock with Cracks and Chops. Now I will proceed to the Cure.

If your Horse has been well-fed, and of good Plight, then you must bleed and purge him two or three Times in a Fortnight's Time ; then you may rowel him in the Belly, or in the Inside of the Thigh, and you may bathe his Legs with any Beef-broth, or Pork-broth, or any greasy Liquor for two or three Days.

Then take of Honey one Pound, Turpentine six Ounces, incorporate them with a Spoon ; then take Fenugreek and Linseed Meal, of each four Ounces, Bay-berries and Juniper-berries dried and made into Powder, of each two Ounces ; boil them in three Quarts of Red Wine Lees to the Thickness of a Poultise, and when you take it off the Fire, add two Ounces of Camphire in Powder, spread it on Cloths, and apply it warm to the Legs, fastening all with a strong Rowler : This may be continued for a Week, renewing it once in two Days.—The camphorated Spirits of Wine are very good alone, and, you may make an Ointment of Hog's-Lard, Turpentine, burnt Aliom, and Verdigrease ; make it so that you may anoint it with your Finger and not melt ; but when you make it, make it all together ; and this is a very good Ointment to heal his Legs when the Humour is turned.

64. *For Warts, Rats-tails on the Legs and Pasterns.*

These are all of the same Kind, and are more or less dangerous, as they are nearer or at a Distance from the large Sinews.

Warts may be wasted by touching them now and then with Aqua-fortis, or they may be cut off when they are superficial ; but the Scratches are for the most Part bred of a tendinous Substance, and have their Roots in or near the Tendons, like the Corns in Mens Feet : Sometimes they grow so hard, that by pressing upon the softer Parts they

<div align="right">cause</div>

caufe violent Pain ; but when this happens, a good Poultife fhould be applied to ripen the Inflamation, unlefs the Matter fpring naturally from the Roots of it, which will loofen them fo as they may be eafily removed by the Ufe of Medicines that are but moderately corrofive ; therefore to proceed, whenever you obferve a Moifture and Rottennefs, you need only apply a Lump of Rye Leaven, mixed with Vinegar and the Juice of Garlick, or Muftard-feed pounded; and with two or three times Application it will bring out the Rottennefs.

Or you may ufe the following Poultife, which is made of Hog's Lard and Cow-dung, or Bran, or Milk and Bread; or this :

Take Hog's Greafe, Soap, Brimftone, and Honey, boil them into a Poultife with a fufficient Quantity of Soot, and to every four Ounces add half an Ounce of the Powder of Verdigreafe, and if your Horfe's Legs have Holes in them, you may properly call it an Ulcer ; then fearch with your Probe which Way they go, then with your Knife cut them into one another, then clean the Wound, and you may heal it up with the Ointment mentioned in N°· 40.

65. *For a Quitter-Bone.*

A Quitter-bone is an Impofthume which breeds between the Hoof and the Coffin-bone, on the upper Part, and makes its firft Appearance by a Swelling on the Cronet, and proceeds from a Blow or a Strain, or over-reaching himfelf, and fometimes it comes by a long continued Swelling of the Legs and Pafterns.

Now if this Ulcer be not of a very long Standing, it may be cured by the Application of Egyptiacum mix'd with Bafilicon or Turpentine ; but if it be of a long Standing, then you muft open the Ulcer, and fearch to the Bottom of the Wound, and if the Mufcles that pafs between the Hoof be rotted, you muft in that Cafe open the Tumour with a fharp Razor, or fome other fharp Inftrument, cutting away all that is corrupted and rotten, either from the Hoof, or any other Part of the Foot. And to make a Way for the Operation, you ought to rafp down fome Part of his Hoof; if any Bits remain, you may apply fome Vitriol, Arfenick, or Marake ; and when you have got it all out clean, then heal up the Wound with Honey and Turpentine, and Tar, and wafh the Wound with Spirits of Wine or Brandy, and when

when it is clean, heal it up with those things before-mentioned, washing it now and then with Copperas or Vitriol-water.

66. *For Foundering in the Feet.*

This is an excessive Pain in the Feet, whereby the Horse being scarcely able to touch the Ground, draws himself in a Heap; and it comes by hard Riding, or Shoeing, and being put into a cold Stable when he is very hot, and that falls into his Feet, then he is said to be founder'd

The Cure is this: Draw out the Sole, and raise the Hoof in two or three Places, and keep the Foot open as wide as you can. Then take Tar, Turpentine and Honey, melted together, with a fourth Part of Spirits of Wine, soaking Hurds in this Mixture, laying them on for two or three Days after the first Dressing, continuing afterwards to make your Applications every Day until the vacant Spaces of the Hoof be filled up. The same Application ought to be made to the Sole, covering the whole Foot with Flaxen Cloths dipt in Oil and Vinegar beat together, which may be fastened with a Rowler, or a pretty long Piece of Lift, and you may melt Pitch and Tar, with a sufficient Quantity of Hog's Lard, pouring in the Mixture boiling hot upon the Sole; but you must pare the Sole very thin, stuffing it up very carefully with Hurds of Tow or Flax: And this is very proper for a Horse that is hot-footed.

67. *For a Prick in the Foot.*

A Prick in the Foot is very bad, and nothing causes more Pain, nor is more troublesome than that Accident, which happens to the Feet by bad Shoeing; or when sharp Splints or Stubs are struck in the tender Parts within the Sole, and the Inside of the Foot is very tender and troublesome, in case it be of a long standing, because it is some Time before you can find it out; and sometimes it is neglected by those who look after them; and when you draw out the Nail, be sure you leave none behind if you can help it, because that will fester and become an Ulcer; but if you can draw the Nail all out, then pour in a little Oil of Turpentine, or Spirits of Wine into the Orifice, and a little melted Wax for some Days, and taking care not to ride him into Water; and if you happen to leave a Bit of the Nail in, you must lay the Hole open, and pick it out, or you may

draw

draw it out with Turpentine. But if after all you find a continued Lameneſs, and the Matter that comes from the Sore is thin and bloody, or yellow, viſcid and ſtinking, you may then reaſonably believe there is an Ulcer formed either in the Bone, or among the Sinews: In this Caſe it will be proper to take up the Sole, and with a Razor or Flem make Inciſions 'till you have got a full View of the Bottom of the Sore, taking Care not to wound the large Sinews, if poſſible, unleſs they be mortified and rotten. You need only apply dry Lint to the Part, or Lint dipt in Spirits of Turpentine, for the firſt Dreſſing, which need not be removed for two or three Days; in which Time the Wound will be digeſted, and the Blood turned to Matter. And if the Coffin-bone be foul, you may ſcale it by the Application of ſome cauſtick Medicine, as the Powder of Sublimate mix'd with Honey; but the beſt Way is to ſear it with a hot Iron, and when the Scales are fallen off, you need only dreſs it with Pledgits dipt in Tincture of Myrrh and Aloes, until the Bone be covered, and over the ſame you may lay Turpentine and Honey, and Spirits of Wine; and if any proud Fleſh put forth, you may dreſs it with the preſcribed Remedies in the Cure of Ulcers, and over the ſame lay a Charge made of Vinegar, Bole, and the Whites of Eggs, all over his Foot and Paſterns, to lay the Heat and Inflammation; and feed your Horſe with opening Diet, and moderate Exerciſe.

67. *For the running Fruſh.*

This Diſtemper is known by the Eye and Smell, and it is like old rotten Cheeſe: it is not dangerous, but very troubleſome, becauſe it cauſes a continual Itching: In order to the Cure, you muſt pare the Foot with your Buttreſs as near as you can, then waſh the Part with Lime-water, or Allom-water boiling hot, then apply a Charge made of Soot, Vinegar, and the Whites of Eggs, and waſh the Part ſometimes with Vitriol-water; and when you perceive the Itching gone off) for the running Fruſh comes by an Itching) you may pour melted Tar all over the Frog, and keep the Foot clean from Dirt and Filth; and when it is clean, ſtop the Foot well with Cow-dung and Hog's Lard, and that will keep the Dirt and Filth out of his Foot.

68. *Of the Crown-scab.*

The *Crown-scab* proceeds from a sharp Matter oozing through the Skin above the Cronet, which frets off the Hair, and hardens into a white mealy Scab. In some Horses it is accompanied with a Moisture, and sends forth a stinking Matter. The Cure is, first, scrape off the Scales gently, and afterwards wash the Sores with Copperas or Vitriol-water; some make use of Spirits of Wine wherein Tobacco has been infused, which oftentimes takes Effect; or you may take Rosin half a Pound, Pitch six Ounces, Turpentine four Ounces, Verdigrease and Brimstone in fine Powder, of each three Ounces; melt the Pitch, Rosin, and Turpentine, over a gentle Fire, and then stir in your Powders; if it be too hard, you may soften it by adding to it a little more Turpentine; and if you incorporate a small Quantity of Quick-silver with it, it will be the better. This must be spread on Leather, and applied to the Part, first shaving away the Hair, letting it lie so long as it will stick; and if the Scabs come off, and it has done running, you may heal up the Sore by the Directions laid down for the Cure of Ulcers.

69. *Directions concerning a Brittle Hoof, or a Soft Hoof, or Narrow Heels, or a False Quarter.*

A brittle Hoof is carried by standing in hot Litter, and long standing in a Stable without Exercise, which by that Means causes a great Heat to his Feet, and to prevent this, keep your Stable clean; and if he stand still in the Stable, give him moderate Exercise, and then you will soon find your Horse's Feet in good Order, if he be in good Health; you may grease his Feet now and then with any fresh Grease, and then you will find his Hoofs to be black, and as tough as Wire.

The next is a soft Hoof, and that is caused by a Humour that proceeds from a running at his Heels, which proceeds from Heats and Colds; it is not a natural Softness, but proceeds from that sharp Humour; and to prevent this, you must purge him, and rowel him in the Belly, and wash his Legs with Vitriol-Water, or Lime-Water, or Copperas-Water; and when you have turned the Humour, and made his Legs perfectly sound, then perhaps you may find his Hoof too brittle; but if they be, you must anoint them as before,

<div align="right">and</div>

and keep his Feet well stuffed, which will be of great Service to him.

The next thing is a narrow Heel, which comes by bad Shoeing; it is what you may call too near, and draws the two Corners of the Hoof, and presses upon the Sole, and makes the Horse go lame; now to give him Ease, you must pare his Foot, and open both Corners, and then shoe him with half-moon Shoes, or Pantofle Shoes, and they will press out the Corners and keep them out; and you may grease the Hoof now and then with Hog's Lard, or any Ointments that are greasy, and shoe him wide.—— A false Quarter is a Reft or Chink in the Quarter of the Hoof from top to bottom, it happens generally on the Inside, that being the weakest Part of the Hoof, and proceeds from the Dryness of the Hoof, when a Horse is ridden in dry, sandy, or stony Ground in hot Weather, or in frosty Weather, and also by bad shoeing; then this Accident is both painful and dangerous, for as often as a Horse sets his Foot on the Ground, the Chink widens; and when he lifts it up, the sharp Edges of the divided Hoof wound the tender Flesh that covers the Coffin-bone. The usual Method taken to remedy this Imperfection, is, by cutting off that Part of the Shoe which lies upon the Chink, that it may be wholly uncovered; then with a Drawing-Iron open the Reft to the Quick, filling it up in all Parts with a Rowel of Hurds dipt in Turpentine, Wax, and Sheep's Suet, melted together, renewing it every Day until the Seam be filled up very well; and after that, care must be taken to keep the Hoof moist with Applications of Tar, Honey and Grease. Some pour in Aqua-fortis into the Reft when the Pain is violent; but if you make use of this, be sure to make a Border on each Side with Wax, for fear of spoiling the reft of the Hoof; then dress his Foot with Tar and Honey, Turpentine and Hog's Lard, or any greasy Ointments, and tie his Foot with Lift to keep it from gargading, and always keep his Foot moist; give him opening Things for his Diet.

70. *For Casting the Hoof.*

The Loss of the Hoof is occasioned by Pricks and Stubs, or Foundering, or riding into cold Water when the Horse is hot; and if the Foot has got any Damage, it will be a

thing

thing impoſſible to procure a new Foot; but if the Foot be found, a new Hoof may be procured with care; when you find your Horſe's Hoof looſe, and crack'd upon the Top of it, then you may apply to the Coffin joint Tar, Turpentine, Oil, Pitch, and ſuch like things melted together; then make a Boot of Leather, with a ſtrong Sole, to be laced faſt about the Paſterns, bolſtering and ſtopping the Foot with fine Flax, that the Tread may be eaſy, renewing the Dreſſing every Day until the new Hoof grow; (the Boot is certainly very proper) the Ointment will not always be ſufficient, ſo I recommend to you the following.

Take of Roſin half a Pound, Oil-olive a Pound, diſſolve the Roſin in the Oil over a gentle Fire, and when it is diſſolved, take it off; and when it begins to cool, put in Myrrh, Aloes, Maſtick, and Olibanum in fine Powder, of each two Ounces; make it into an Ointment, and having made an eaſy Bandage over it, return it into the Boot; if the Ointment requires more Powder, you may add the Powder of White Vitriol, or burnt Allom to a Pound of Ointment, with half an Ounce of Orpiment, whereby the Hoof may be preſerved ſmooth, being dreſſed once a Day in the manner directed. It is the way of ſome Farriers, when they perceive the new Hoof growing, before the old one falls off, to pull away the old one; but they ought not to be too haſty, for the old one ſerves as a Cover for the new one; and if the Horſe be young, you may turn him to Graſs, for that will keep his Foot cool, and by this means he may come to have a very good Foot again, and do good Service. I knew a Horſe which had all his four Hoofs came of, and came again, and the Horſe did a great deal of good Service after that the new ones were come again.

71. *Receipts for Ointments.*

Now for all freſh Wounds, and them that are clear, greaſy Ointments are beſt, ſuch as be made of Hog's Lard, Honey, Turpentine, Roſin and Pitch, or Marſh-mallows; ſometimes you may put in a little burnt Allom, or Verdigreaſe, or Soot is very good, and you muſt make it ſo as it will keep the Wound clean, and make it as you think proper, more of one ſort than another, ſuitable for the Wound.

72. *Water for all Sorts of Wounds.*

Allom Water, Copperas Water, or Vitriol Water, or Lime Water, or Vinegar, or Chamberlie, or Spirits of Wine, or Brandy, are very good to wash all fresh Wounds; make them Milk-warm when you make use of them.

73. *For old Ulcers and hot Furmations.*

These are made of the Lees of Wine, or strong Beer Emptying, and all manner of Herbs, as Rue, Mint, Burdock, Hemlocks, Plantain, Colts-foot, Dandelion Roots, Nettles, or any hot spiritous Herbs; boil them for two Hours, then take it off the Fire, and put in Spirits of Wine, or Camphire, and a good Piece of Soap, and use it almost boiling hot, for 'tis the Heat that puts a stop to a Mortification, and all Spirits and warm Things are good for all rotten Ulcers and hard Swellings; and for a Poultise, take Oatmeal, Milk, Bran, and Hog's Lard, which are very good for a running Wound, or hard Swelling. Take Nettles, or the Roots stamped in a Mortar, then put them into old Barm, and the Whites of Eggs; then lay some hot Horse-dung after you have laid on the Poultise, for the Heat of the Dung is a great Help to the Poultise, and will sink it and bring it to a Head, so that you may open it with your Lancet.

74. *For all Caustick Remedies, the following is proper for old, stinking, rotten Ulcers.*

Such as Arsenick, Mercury, Vitriol, Copperas, Quicksilver, Oil of Vitriol, Oil of Spike, or any other caustick Remedies; you must take a great deal of Care in using these Remedies, for if they touch the Bone, you can make no Cure; but you must use a little at a time, and in forty-eight Hours you may see what Effect it takes; and then you may put on a little more; and to clean the Wound, and bring the Core quite out, you must dress it with Honey and Turpentine, and then lay on burnt Allom and Verdigrease, and that will clear the Wound.

75. *An Ointment for the Eyes.*

Take one Handful of common Dasie-Roots, wash them clean, and stamp them in a Mortar; then strain the Juice
through

through a clean Linen Cloth, and put to the Juice an Ounce of Honey, and boil it over an eafy Fire in an earthen Fipkin till it becomes like a Syrup, and keep fkimming the drofly Sulphur off, then take it off the Fire. This is an excellent Thing to clear the Sight, or to take off a Kell which obftructs the Sight, anointing the Eye with a Feather. *Approved.*

Courteous Reader, I come now to a Conclufion of the whole Matter, and I hope it will not pafs for any Breach of Modefty, to fay, that the greateft Part of my Life has been fpent in ftudying the beft Methods I could, to promote the publick Benefit in my own Faculty, and the Succefs has often been anfwerable to the Pleafure I have taken in the Work. ——— Now you that will take the Pleafure to read over this fmall Treatife, and follow the Rules which I have given you, need not fear breeding of good Horfes and Mares, either for common Bufinefs or for Hunting ; and I fhould be glad if any Gentleman would once make a Trial of it, for then he would be very well fatisfied in the Affair ; and if this takes Effect, it is my Defign to make fome little Addition further concerning this Affair. ——— If thofe Men who are Mafters of Horfes would but once make a Trial of thefe Rules, they would foon find out the great Miftakes that are made by thofe Men who are not Mafters of their Bufinefs ; and when thofe Faults come to be amended, then your Pleafure will be to fee your Horfes in good Health and Profperity ; for what Creature is there in the World that is fo handfome as a Horfe, when in his Prime ? And when you have made Trial of this Treatife, you cannot but be fenfible of the Errors which have been made ; and thefe Rules muft be your Guide for all thofe that have but little Judgment in being a Groom and have not the right Art of Riding, nor preferving the Health ; I fay, for thofe is this Treatife defigned : And if any Accident fhould happen, you have a Remedy carefully prepared, with as little Coft as can be, and at laft you will enjoy your Horfes with great Pleafure, befides the Benefit you will receive by them, which will requite you for all the Trouble you have been at. For my Part, I have had as much Pleafure in doing Good, (that is, in penning this Book) as you that make ufe of it ; and I heartily wifh, that whofe Hands foever this Book may light into, they may find the Benefit of

of it. For this I may say in my own Behalf, I have been very studious in his Affair, to find out proper Methods for the breeding of good Horses, &c. For what a Pity is it that such a fine Creature as a Horse is, should be so much abused as they have been for some time past: And if I have committed any Mistakes, I should be glad to be made sensible of them, and take it as a Favour: From

Yours,

Sept. the 27th,
1739.

J. R.

F I N I S.
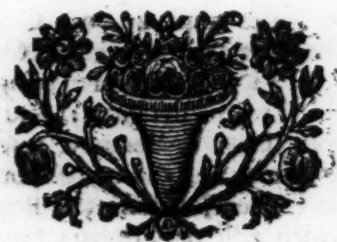
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